

THE GREAT & SMALL GAME
OF INDIA

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THE GREAT AND SMALL GAME OF
INDIA, BURMA, & TIBET

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THE
GREAT AND SMALL GAME
OF
INDIA, BURMA, & TIBET

BY
R. LYDEKKER

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WITH CONTRIBUTIONS BY SPORTSMEN

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PREFACE

FROM its predecessor and companion, *The Great and Small Game of Africa*, the present volume differs in that it is mainly the work of a single writer. In order, however, that it should not lack the personal experiences which constitute such a valuable feature in the former, an appendix has been added, in which several well-known sportsmen record their experiences of the *shikar* of some of the larger species. To these gentlemen the author owes his most cordial thanks. It may be added that the author himself has seen many of the Himalayan and Tibetan mammals in their native haunts; but where his own personal observations and recollections are insufficient for his purpose, he has not hesitated to quote largely from the writings of those who have been more fortunate in their experiences.

The general systematic treatment of the subject is the same as that adopted in Mr. Blanford's volume on Mammals in the *Fauna of British India*; and the author takes the opportunity of stating how much he has been indebted to that admirable work on this and other occasions. The descriptions of the different animals are, however, drawn up on somewhat more popular lines than in Mr. Blanford's work. And it will be found that species are divided up into local races to a greater extent than in the latter; this being due to the more detailed study which has been expended on the subject since the appearance of the volume in question.

Many of the animals described here have been already treated of by the author in *Deer of All Lands* and *Wild Oxen, Sheep, and Goats of All*

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Lands; and it has consequently been a matter of considerable difficulty to avoid undue repetition. A few of the illustrations in the text have been reproduced from the works last mentioned, but the majority of these are new. Many of them are from photographs, taken expressly for this work by the Duchess of Bedford, to whom the author's most grateful thanks are hereby tendered. His acknowledgments are likewise due to the Maharaja of Kuch Behar, Sir Robert Harvey, Mr. A. O. Hume, Mr. R. M'D. Hawker, and several other gentlemen, as well as to the Council of the Zoological Society, for permission to reproduce photographs or figures.

Since the text was in type the serow of the Malay Peninsula has been separated from the Sumatran animal as a distinct species by Mr. A. L. Butler in the *Proceedings of the Zoological Society of London* for 1900, p. 675, under the name of *Nemorhædus swettenhami*. Its chief claim to distinction is the blacker colour of the entire coat, especially on the legs, which are wholly black, so that the general appearance of the animal is uniformly dark. In place, however, of being a distinct species, it is probable that the Malay serow should be regarded as a local phase of the Sumatran animal, when its title will be *N. sumatrensis swettenhami*.

HARPENDEN LODGE, ST. ALBANS,
Michaelmas 1900.

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THE GREAT AND SMALL GAME OF INDIA, BURMA, AND TIBET

INTRODUCTION

THE vast area of which the game animals (or, to speak correctly, game mammals) are described in the present volume may be designated in popular language "the Sportsman's India." Roughly speaking, it is taken to include the drainage-basins of the Indus, Bramaputra, and Irawadi rivers, or the greater portion thereof, together with the whole of India, the island of Ceylon, and the maritime province of Tenasserim. Including a large part of Baluchistan and Afghanistan, the area is well defined towards the north-west by the immense barrier of the Hindu-Kush and Karakoram ranges. Eastwards of the latter the boundary is fixed by the Tangla Mountains, to the north of Lhasa, whence an arbitrary line may be drawn to the eastern frontier of Burma, which may be taken as the boundary in this direction. The whole of Tibet and the Himalaya will consequently fall within the area treated of; but, on the other hand, Eastern Turkestan and China, as well as Siam and the Malay Peninsula, are excluded.

It has to be acknowledged that, in fixing these limits, a somewhat arbitrary division has been made; and it has been urged upon the writer that it would have been better to include the whole of Asia, as it seems

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rather illogical to describe certain of the wild sheep and deer of Central Asia to the exclusion of others. And undoubtedly there is much to be said for this view. On the other hand, the fauna of Western Asia passes imperceptibly into that of Eastern Europe, so that if Asia were taken as the limits of the area to be included, the boundary would be fully as arbitrary, from the point of view of the fauna, as is at present the case, if, indeed, it were not more so. Of course, there is the reply, Why not include Europe also? But to describe the game animals of such a large area as the whole of Asia and Europe is a task which neither the author nor the publisher are, for the present at any rate, inclined to undertake.

The area, as thus limited, contains an assemblage of game animals belonging to two great zoological provinces; those of the cis-Indus and cis-Himalayan portion of the area, together with Burma and Tenasserim, pertaining to what naturalists call the Oriental region, while those beyond these limits come within the Eastern Holarctic or Palæarctic region. The northern frontiers of India and Burma are, in fact, the meeting-place of two great faunas. But in Burma and India themselves minor zoological subdivisions are indicated by the distribution of the game and other animals. In Tenasserim, for example, the animals are distinctly of a Malayan type, as is instanced by the presence of the tapir, the Malay bear, the banting, and the binturong. And these Malayan types are traceable, although with an intermingling of peculiar forms, like the *thameng*, into Assam and the Eastern Himalaya; the Malayan forms being perhaps even more pronounced in the latter area than they are in Burma. Other Malayan types are the two smaller species of Asiatic rhinoceros, one of which has penetrated into Lower Bengal.

Of the game animals of Burma itself, some, like the gaur, are identical with those of India; others, like the banting, are Malayan; while others again may be regarded as Eastern representatives of Indian forms. As an instance of the latter class may be cited the *thameng* and the Malay

sambar, which are respectively the Burmese representatives of the Indian swamp-deer and Indian sambar. Assam forms the meeting-ground of the Indian and the Burmese faunas.

Peninsular India, which is properly restricted to the area south of the great plain formed by the alluvium of the Indus and Ganges, but which is often considered to extend to the foot of the Himalaya, is, of course, the home of the true Indian fauna, examples of which are the chital, the hog-deer, the swamp-deer, the Indian sambar, the nilgai, and the sloth-bear. But, even apart from minor divisions due to varying conditions of climate, soil, vegetation, etc., Peninsular India is by no means uniform as regards its animals. And the Malabar coast is very distinct in this respect from the whole of the remainder of the area, although showing considerable resemblances to Ceylon, except the north of the latter, which is more akin in its animals to Peninsular India generally. Many characteristically Indian animals, such as the tiger, the Indian wolf, and the swamp-deer, are, however, absent from Ceylon.

In the trans-Indus districts of the Punjab, and still more markedly in Western Sind, Baluchistan, and Afghanistan, we gradually take leave of the fauna of Peninsular India (and with it that of the Oriental region generally), and find it replaced by a Persian element; these Persian types pertaining to the Holarctic fauna of Western Asia and Europe. Examples of such western types are met with in the form of the European wolf, the Persian leopard, the wild ass, and the Persian gazelle. The lion, too, belongs to this Persian fauna, although it has succeeded in penetrating farther into India than some of the other members. All traces of the Malayan fauna, such as tapirs, the two smaller species of rhinoceros, and the Malay bear, are totally wanting from the area occupied by the Persian fauna.

In the cis-Indus Salt Range of the Punjab we meet with an outlier of the Persian fauna in the form of the true urial. This animal, together with the straight-horned markhor of the trans-Indus Suleman Range, like-

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wise serves to connect the Punjab-Persian fauna with that of Central Asia, which also forms a part of the great Holarctic region.

It has been already mentioned that the animals of the Eastern Himalaya display a marked resemblance to the Malayan type. Passing westwards along the chain, this Malayan element practically disappears west of Nepal ; and from thence the Himalayan fauna as far north as the limits of trees is to a great extent transitional between that of Peninsular India on the one hand and that of Central Asia on the other. Kashmir, which comes within the limits of this intermediate zone, exhibits the transition between the Oriental and Central Asian fauna very markedly, with some indications of a Persian element. The Himalayan black bear is a very characteristic animal of this zone, as are the tahr and the goral.

With the high Himalaya and the more or less arid districts of Gilgit, Ladak, etc., we enter the area inhabited by the Tibetan fauna, which is more or less markedly distinct from that of the rest of Central Asia. Among these peculiar Tibetan types may be cited the yak, the chiru, the goa, and the kiang, together with various wild sheep, all of which are inhabitants of very arid and elevated country. Further eastwards, in the Lhasa district, we enter the limits of a subdivision of this fauna adapted to live at a lower elevation in a more humid climate ; among the members of this group being the short-tailed panda, the takin, Thorold's deer, and the Tibetan blue bear.

Passing on to Turkestan and Altai country, the home of Marco Polo's sheep, the true argali, the East Asiatic wapiti, and the Siberian roe, we reach the tract populated by the typical Central Asian fauna, lying beyond the limits to which the present volume is restricted. The tiger is probably to be regarded as a wanderer from the Central Asian fauna into India and the Malay countries.

With these few preliminary remarks on a very difficult but very interesting subject, the description of the various species may be commenced.

THE INDIAN ELEPHANT

(*Elephas maximus*)

NATIVE NAMES.—*Hathi*, *Hathni* (female), HINDUSTANI ; *Hasti* AND *Gaja*, SANSKRIT ; *Fil*, PERSIAN ; *Haust*, KASHMIRI ; *Gaj*, BENGALI ; *Ane*, TELEGU, TAMIL, CANARESE, etc. ; *Yani* OF THE GONDS ; *Hattanga*, *Khonda*, AND *Eniga*, TELEGU ; *Yanei*, *Kunjaram*, AND *Veranum*, MALABARI ; *Ata* AND *Allia*, CINGALESE ; *Tengmu* OF THE LEPCHAS ; *Langcheu* AND *Lambochi* OF THE BHOTIAS ; *Mongma* AND *Naplo* OF THE GARO HILL TRIBES ; *Migung*, KACHARI ; *Atche* OF THE AKAS ; *Sotso*, *Supo*, *Chu*, AND *Tsu* OF THE NAGAS ; *Sitte* AT ABOR ; *Tsang* IN KHAMTI ; *Magui*, SINGPHO ; *Saipi* OF THE KUKIS ; *Amieng* AND *Manyong* IN THE MISHMI HILLS ; *Samu* OF THE MANIPURIS ; *Tsheng*, BURMESE ; *Tsing*, TALAIN ; *Tsan* IN THE SHAN STATES ; *Kahsa* OF THE KARENS ; *Gaja*, MALAY

(PLATE I. FIG. 1)

In all works of sport, and in the majority of those on natural history, the Indian elephant, if it be not called *Elephas asiaticus*, is termed *E. indicus* ; but at the present day it is the fashion to follow priority in nomenclature, and according to this the proper name is undoubtedly *E. maximus*. It may be objected that, on the average, the Indian elephant is a smaller animal than its African relation, and that, accordingly, the latter name is invalid ; but objections of this class are disregarded by naturalists, and sportsmen should consequently make up their minds to accept the change.

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As the largest and most strange in appearance of all the animals of India, the elephant looms large in the ancient traditions and religions of the country, figuring in the Hindu mythology as Ganesa—the elephant-headed god. From its ancient Sanscrit names *Hasti* and *Gaja* are derived most of its titles among the Aryan tribes of India; while even the Malays, who speak a tongue of totally different origin, have adopted the latter of these two names. Although now the sole representative of its tribe in Asia, the Indian elephant is the survivor of a whole host of species formerly inhabiting the country from which it takes its name; some of these extinct species being very close to their existing descendant, while others (mastodons) had teeth of a totally distinct type, some of them being provided with tusks in both the upper and lower jaws. From the number of its species, coupled with the fact that it is here alone that a complete transition is to be found between the mastodons and the modern elephants, it is indeed probable that South-Eastern Asia was the original home of the group.

As everybody knows an elephant by sight, while many people are acquainted with the leading external differences between the Asiatic and the African species, it will be quite unnecessary to point out the peculiar characteristics of elephants in general, or to enter in any great detail into the consideration of the features by which the two living representatives of the group are distinguished from one another. An exception in regard to one particular of elephant anatomy may, however, be made, seeing that comparatively few people grasp the peculiar mode of development and replacement obtaining in the teeth of these animals.

As regards the tusks (which, by the way, do not correspond to the tusks of a wild boar, but to one of the pairs of incisor or front teeth), these arise from the upper jaw, and grow throughout the entire life of their owner, after they have once made their appearance. In very young elephants they are preceded by a pair of milk-tusks, which

are soon shed. And here it may be mentioned that the present writer once had a friendly dispute with the late Mr. G. P. Sanderson as to the existence of these said milk-tusks. With the intention of convincing the writer that no such tusks existed, that sportsman sent down to



FIG. 1.—Skull of Indian elephant, showing the worn masticating surface of the fifth pair of molars, behind which are the unworn sixth pair, whose summits during life were still in the gum.

Calcutta the skull of an extremely young elephant supposed to have the permanent tusks in a very early stage of growth. When one of these tusks was removed from the jaw, it was, however, found to have the lower extremity closed, whereas, as everybody knows, the permanent tusks have the lower end open throughout life. Consequently, Mr. Sanderson was convinced of his mistake. The identical skull in question

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is now exhibited in the beautiful series of mammalian teeth displayed in the entrance hall of the Natural History Museum.

As regards the molar or cheek-teeth of elephants, there are six pairs developed in each jaw, but only portions of two of these are in use at any one time, and in an aged animal there is but one on each side of both the upper and the lower jaw. These teeth are composed of a number of vertical transverse plates closely packed together; the number of such plates gradually increasing from the first tooth, in which there are four, to the last, which may have as many as twenty-four. The teeth are pushed up in the jaws in an arc of a circle, and as each tooth becomes worn down, it is gradually pushed out from behind by its successor, which at the same time takes its place. And, of course, the end of this process is that the animal is eventually left with but a single pair of grinding teeth in each jaw; and when these are completely worn away by use, a term must naturally be put to the life of their owner.

Compared with those of its African relative, the molars of the Indian elephant have their component plates narrower and more numerous, with the layers of enamel thrown into a number of fine puckers or pleats. Consequently, on the worn surface of the crown, the disks formed by the abraded plates are much the more numerous and narrower in the Indian species, while their enamel-borders are thin and pleated instead of comparatively thick and plain.

The females of the Indian elephant carry, as a rule, but very small tusks, which do not project beyond the lips, and in some cases the males show an equally poor development of these weapons. Such unarmed males are known in India as *makhna*, in contradistinction to the *dauntela*, or tuskers.

Usually the Indian elephant has five polished hoof-like nails on the fore, and four on the hind-feet. But the most striking external point

of distinction between this and the African species is to be found in the comparatively small size of the ears. Next to this comes the presence of a finger-like process on the front edge only of the tip of the trunk, the African species having such a process on both the front and hind margins. The skin is comparatively smooth, and the coarse bristles on the tail are confined to the front and back edges for some distance above the tip. Other noticeable features in the present species are the comparative flatness of the forehead and the regularly convex profile of the back.

Much ink and paper have been used in the course of discussions relating to the height attained by the Indian elephant, but since the subject has now been thoroughly threshed out, it will be treated very briefly on the present occasion. Roughly speaking, about 9 feet may be given as the ordinary height for large males, and 8 feet for females. But an elephant of 9 feet 4 inches has been killed in Ceylon, and one of 9 feet 7 inches in Mysore; while two are known to have attained the height of 10 feet 1 inch, a third of 10 feet 4 inches, and a fourth (killed by Viscount Powerscourt in Gurhwal) of 11 feet. All these dimensions appear, however, to be dwarfed by a huge skeleton in the Indian Museum, Calcutta, which indicates that during life the animal to which it belonged was at least a dozen feet in height.

Of tusks, the three longest specimens on record respectively measure 8 feet 9 inches, 8 feet 2 inches, and 8 feet; their respective weights being 81, 80, and 90 lbs. But these are by no means the heaviest—one, whose length is 7 feet $3\frac{3}{8}$ inches, weighing 102 lbs.; while a second, of which the length is 7 feet $3\frac{1}{4}$ inches, scaled 97 $\frac{1}{2}$ lbs., both these two latter examples being from Ceylon. Of the largest pair in the possession of the British Museum, which belonged to an elephant killed in 1866 by Colonel G. M. Payne in Madura, one tusk measures 6 feet 8 inches in length, and weighs 77 $\frac{3}{4}$ lbs., the other being somewhat

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smaller. As regards the circumference of the base of the foot, the following are the six largest examples recorded by Mr. Rowland Ward, namely, $67\frac{1}{2}$, $62\frac{1}{2}$, 61, $60\frac{1}{2}$, and 60 (two) inches.

Within the area treated of in the present volume, the elephant inhabits the forest districts of India, Ceylon, Assam, and Burma, although it is now exterminated in several parts of the country where it formerly flourished. Indeed, were it not for the strict protective laws established by the provincial Governments of India, as well as by the authorities in Ceylon, this noble beast would have long since disappeared from most of its present haunts, even if it had not ceased to exist altogether. Eastwards and southwards of Burma the elephant is to be met with in the Malay Peninsula, Siam, and Cochin China, as well as in the great islands of Sumatra and Borneo, although in the last of these its presence may have been originally due to human agency.

Much discussion has taken place as to whether the Sumatran and the Ceylon elephant, which were at one time grouped together, are distinct from the continental animal. It was said, for instance, that the Sumatran elephant was more slenderly built, with a longer and more slender trunk, and the extremity of the tail more expanded, and furnished with longer and stronger bristles; while there were also stated to be points of difference connected with the cheek-teeth and the skeleton. In connection with these alleged differences the late Dr. Hugh Falconer, who paid great attention to the study of elephants, both recent and fossil, wrote as follows :—" Even in the sal-forests of North-Western India, at the extreme northern limit of the species at the present day, the difference of slender-built and squat-built elephants is well known, being expressed, for the Bengal variety, under the designation of 'Mirghi,' or Cervine, for the former, and 'Koomarea' for the latter, or, when the characters are combined, 'Sunkarea.' The trunk varies in a similar manner, being somewhat short and thick in some, and long and more

The Elephant

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slender in others. The fringe of bristles to the tail is variable in degree, according to the sex, age, and vigour of the animal. A good fringe is seldom retained long in captivity; when present, it always enhances the price of the animal in the estimation of the natives of India. That the animal varies considerably in appearance, according to the district in which it has been captured, has long been well known in India. Abu Fuzl, in his account of the elephant-stables of Akbar, enumerates six varieties, distinguished by form, different marks, or colouring; and the experienced mahouts attached to the Government Commissariat in Bengal will tell at a glance the district where a recently caught elephant has been bred, whether the sal-forests of the North-West Provinces, Sylhet, Assam, Chittagong, Tippera, or Kuttak."

The same writer then goes on to demonstrate that since the alleged osteological differences between the Sumatran and the continental Indian elephant are non-existent, while there are no constant features of distinction in their teeth, the two are not specifically separable.

So far as the question of *species* is concerned, the truth of this conclusion may be accepted without hesitation. It is, however, quite probable that the Sumatran elephant may belong to a *sub-species* or local race, different from the one inhabiting the Indian mainland, if indeed there be only a single race in the latter area. It may be added that the Ceylon elephant was regarded as identical with the Sumatran form; but if the latter indicate a separate race, it is practically certain that the Ceylon animal must likewise be distinct, since it differs from the mainland form by the rarity of tusks in the males, which are said to occur only in about one out of every three hundred individuals.

At present the materials existing in England are quite insufficient to allow of any definite opinion being given on these points. If the Sumatran elephant be distinct, it will have to be known as *Elephas maximus sumatranus*.

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As regards the present distribution of elephants in India itself, these animals are found along the foot of the Himalaya as far west as the valley of Dehra Dun, where the winter temperature falls to a comparatively low point. A favourite haunt used to be the swamp of Azufghur, lying among the sal-forests to the northward of the station of Meerut. In the great tract of forest between the Ganges and Kistna rivers they occur locally as far west as Bilaspur and Mandla; they are met with in the Western Ghats as far north as between latitude 17° and 18° , and are likewise found in the hill-forests of Mysore (the hunting district of G. P. Sanderson in his earlier days), as well as still farther south. In this part of the peninsula they ascend the hills to a considerable height, as they do in the Newera Ellia district of Ceylon, where they have been encountered at an elevation of over 7000 feet above the sea. There is historical evidence to prove that about three centuries ago elephants wandered in the forests of Malwa and Nimar, while they survived to a much later date in the Chanda district of the Central Provinces. At the comparatively remote epoch when the Deccan was a forest tract, they were probably also to be met with there, but the swamps of the Bengal Sandarbans appear to be unsuited to their habits.

So many excellent accounts of the mode of life of the wild Indian elephant are extant (those by Sir J. E. Emerson Tennent, Sir S. Baker, and Mr. G. P. Sanderson being among the best), that a very short notice will here suffice. The structure of the teeth is sufficient to indicate that the food consists chiefly of grass, leaves, succulent shoots, and fruits; and this has been found by observation to be actually the case. In this respect the Asiatic species differs very widely from its African relative, whose nutriment is largely composed of boughs and roots. Another difference between the two animals is to be found in the great intolerance of the direct rays of the sun displayed by the

Asiatic species, which never voluntarily exposes itself to their influence. Consequently, during the hot season in Upper India, and at all times except during the rains in the more southern districts, elephants keep much to the denser parts of the forests. In Southern India they delight in hill-forest, where the undergrowth is largely formed of bamboo, the tender shoots of which form a favourite delicacy ; but during the rains they venture out to feed on the open grass tracts. Water is everywhere essential to their well-being ; and no animals delight more thoroughly in a bath. Nor are they afraid to venture out of their depth, being excellent swimmers, and able, by means of their trunks, to breathe without difficulty when the entire body is submerged. The herds, which are led by females, appear in general to be family parties ; and although commonly restricted to from thirty to fifty, may occasionally include as many as one hundred head. The old bulls are very generally solitary for a considerable portion of the year, but return to the herds during the pairing season. Some “rogue” elephants—*gunda* of the natives—remain, however, permanently separated from the rest of their kind. All such solitary bulls, as their colloquial name indicates, are of a spiteful disposition ; and it appears that with the majority the inducement to live apart is due to their partiality for cultivated crops, into which the more timid females are afraid to venture. “Mast” elephants are males in a condition of—probably sexual—excitement, when an abundant discharge of dark oily matter exudes from two pores in the forehead. In addition to various sounds produced at other times, an elephant when about to charge gives vent to a shrill loud “trumpet” ; and on such occasions rushes on its adversary with its trunk safely rolled up out of danger, endeavouring either to pin him to the ground with its tusks (if a male tusker) or to trample him to death beneath its ponderous knees or feet.

Exact information in regard to the period of gestation of the female

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elephant is still a desideratum ; this being mainly due to the remarkable circumstance that in India elephants very rarely breed in captivity, although they are said to do so much more commonly in Burma and Siam. From observations made in Philadelphia on elephants in a menagerie, Mr. H. C. Chapman estimated the duration of pregnancy at as much as twenty-two months ; but other observers have put it at nineteen, while by some it has been reduced to eighteen months. Possibly the native explanation, that the period is twenty-two months in the case of bull calves, and eighteen in that of females, may prove to be correct. The newly born calf almost immediately stands on its feet, and soon after sucks, effecting the latter operation by raising its trunk and applying its mouth to the maternal teats, which are two in number and situated between the fore-legs. Very rarely two calves are produced at a birth.

Elephant shooting, which is practised on foot, is perhaps the most dangerous of all Indian field-sports ; and a charging elephant needs all the nerve and coolness of the sportsman. Describing the charge of an elephant, Mr. Sanderson observes that "the cocked ears and broad forehead present an immense frontage ; the head is held high, with the trunk curled between the tusks, to be uncoiled in the moment of attack ; the massive fore-legs come down with the force and regularity of ponderous machinery ; and the whole figure is rapidly foreshortened, and appears to double in size with each advancing stride. The trunk being curled and unable to emit any sound, the attack is made in silence, after the usual premonitory shriek."

Here it may be mentioned that an elephant drinks by sucking up water with its trunk and then pouring it into its mouth ; all food being likewise conveyed to the mouth by the same organ.

With modern weapons of precision and penetrating power, and the accurate knowledge possessed of the vital points of an elephant by the majority of sportsmen, these animals are now generally despatched with

comparative speed and certainty. Not so, however, in the old days, as the following account of an old "rogue," whose skull is now in the British Museum, sufficiently attests. This elephant, writes Dr. Falconer, "was killed in the jungles, on the banks of the Ganges, at no great distance from Meerut, in May 1833, by a party of five experienced sportsmen, who went out for the express purpose of killing it. The savage animal made no fewer than twenty-three desperate and gallant charges against a battery of at least sixteen double-barrelled guns, to which it was exposed on each occasion, and fell, after several hours, with its skull literally riddled with bullets. Besides the shot-holes of its last engagement, the frontal plateau alone bears, above the nasals, the healed canals of at least sixteen bullet-holes received in previous encounters, exclusive of those effaced by the confluent fissures of its latest wounds."

An examination of the battered skull shows that not a single bullet had penetrated the comparatively small brain-chamber; all having traversed merely the surrounding mass of honeycomb-like bone, where they could do but little damage. To reach the vital brain-cavity, the sportsman selects one of three shots. In the case of the front shot, the point at which to aim varies according to the position of the elephant at the moment of pulling the trigger. When, for instance, the animal is standing facing the sportsman in the ordinary position the point at which to aim is situated in the middle line of the forehead about 3 inches above the plane of the eyes. On the other hand, if the elephant is in the act of charging, the front shot must be planted lower down, near the base of the trunk; and since the bullet has then to traverse a much greater thickness before entering the brain-chamber, high penetrative power on the part of the projectile is of the utmost importance; moreover, a very slight error in the aim will render this shot ineffectual. When the sportsman is on one side of the elephant, the temple-shot is the most effective; the rifle being aimed so that the bullet should strike the aperture of the ear, or the immediate

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neighbourhood of the same, in such a manner as to pass out on the opposite side of the skull in the same region. The rear, or ear-shot, should be planted in the hollow just above the conspicuous bump or swelling at the junction of the jaw and the neck, and should be taken so as to form an angle of about 45° with the elephant's course from behind. In addition to these three head-shots, there is also a shot behind the shoulder, although this does not find much favour among sportsmen.

With the aid of the excellent diagrams given in Mr. Sanderson's book, the sportsman who essays elephant shooting for the first time should make a careful study of the vertical section of the skull of one of these animals, so as to make himself thoroughly acquainted with the locality and relations of the brain-chamber. With regard to the best methods of tracking and approaching elephants in the jungle, he cannot possibly do better than consult the well-known work, *Thirteen Years among the Wild Beasts of India*, of the sportsman last named.

Allusion has already been made to the fits of passion which occur in elephants when *mast*; but the following remarkable instance of a wild elephant trying conclusions with a railway train, which occurred at Perak, in the Malay Peninsula, on 18th August 1899, is worthy of special mention. According to an article in *The Asian* newspaper of 21st November in the same year, it seems that "the duel occurred in broad daylight, and the elephant was the deliberate aggressor. It appears that the engine-driver, seeing a big tusker ahead on the permanent way, brought his train (a goods) to a standstill; whereupon the tusker, encouraged by his strange enemy's unwillingness to attack, took the offensive and charged bravely, so bravely that he knocked his tusks to pieces and injured his head, doing, as may be supposed, commensurate damage to the engine. For over an hour, says the story, the elephant held the position, charging repeatedly; when the driver backed his engine the elephant stood aside, but the moment it advanced he renewed the attack. A truly resolute elephant this, for when he had

battered his head sore upon the engine, he turned his hind quarters to it and endeavoured thus to overcome it !”

Later on in the same article it is stated that “on the night of the 16th of September 1892 an elephant, described as ‘not a very old one,’ forced his way through the fence near Okturn station on the Rangoon-Mandalay Railway, and strolling up the embankment got upon the metals just as the Mandalay mail came at full speed round a curve. Probably he was utterly bewildered by the rush and roar, with its accompaniment of blazing lamp and spark-showers. At all events he stood his ground and received the attack on his head, with the result that his skull was literally shattered and his carcase thrown over the embankment, the train passing on its way without injury. The fact that the line ran on the top of an embankment at the spot where this encounter took place was probably an important factor in securing the safety of the train. If the collision had occurred in a narrow cutting the elephant’s carcase must have derailed the train, and probably caused a serious accident. Yet there recurs to mind particulars of the railway accident which occurred on the night of 28th September 1892. The Bengal-Nagpur up-mail, while travelling at speed about half-past nine through the jungles which flank the line between Gaikara and Monarpur, came suddenly in collision with an elephant. Needless to say it was a pitch dark night. The engine appears to have struck the beast on the flank, for the cowcatcher swept him clean off his legs, and he rested partially on the foot-plate until the driver reduced speed and his body slid down in front of the engine, which now pushed him along the metals, mangling him in a terrible fashion before it pushed his remains aside over the embankment. The train was travelling at a rate of 30 miles an hour, and the elephant was a very big bull, with tusks 6 feet long, and although his weight before the engine helped the brake to stop the train, it was derailed before it could be brought to a standstill. This collision took place on an embankment. It was sheer good luck that the engine

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took the elephant fair and square as it did. The remains of the elephant were found dead at the foot of the embankment next morning ; the engine lost both its head-lights in the encounter, the brake gear was injured, and the smoke-box door partially battered in."

Before concluding the subject of elephants it may be mentioned that these animals are peculiar among existing warm-blooded quadrupeds for the almost vertical position occupied by the bones of the limbs. "The motions and positions of the elephant's limb," remarks Professor H. F. Osborn, "as shown by instantaneous photography, are very surprising. It is safe to say that the study of the skeleton alone would have given us a very faulty conception of the animal. The two most striking features are the great play of the wrist-joint and the straightness of the limbs. . . . In standing, the bones of the fore-limb are in a nearly vertical line from the scapula [shoulder-blade] downwards. The elbow-joint is, in fact, much straighter in extreme extension than we should have inferred experimentally by fitting the bones of the arm and fore-arm together."

THE INDIAN RHINOCEROS

(*Rhinoceros unicornis*)

NATIVE NAMES.—*Gaında* and *Gargadan*, HINDUSTANI ; *Karkadan*,
PUNJABI ; *Gonda*, BENGALI

(PLATE I. FIG. 2)

No one is likely to confound a "rhino" with a giraffe, and yet these are the only two groups of living animals furnished with a horn situated in the middle line of the skull.¹ The horn of a giraffe is, however, very

¹ The southern right-whale has a curious warty protuberance on its nose, which recalls a blunted horn.

unlike the horn (or horns) of a rhino, being composed of a boss of bone, covered with skin, and situated on the forehead of the skull, to which in adult age it is immovably attached. In all living rhinos, on the other hand, the horn (or horns) is composed of agglutinated hairs, and has no firm attachment to the bones of the skull, which are merely roughened and somewhat elevated so as to fit into the concave base of the solid horn. As Sir Samuel Baker has well remarked, the attachment of the horn of a rhino to the skull is very like that of the leaves of an artichoke to the "choke." In those species of living rhinoceros in which there is but a single horn, this is always placed immediately above the nose, and it is only in the two-horned species that there is a horn on the forehead, comparable in position with the giraffe's median horn. There is, however, an extinct European rhinoceros with a single horn having the same situation as the latter. An equally marked structural difference obtains between the solid hair-like horn of a rhino and the hollow horn of an ox, sheep, or antelope on the one hand, and the entirely bony antler of a deer, so that these appendages are absolutely distinctive of the former animals. It happens, however, that the female of the Javan rhinoceros is frequently more or less completely hornless, and since the same condition obtained in both sexes of certain extinct species (some of which are found in India), it is obvious that other characters must be sought in order to properly define these animals.

Rhinoceroses, then, are huge, clumsily-built animals, with long bodies, large heads, surmounted by the aforesaid horn or horns, short and thick legs, and sparsely-haired or naked skins of great thickness. In all the living species there are three toes to each foot, each encased in a small hoof-like nail at its termination, and the middle one being larger than either of the others, and symmetrical in itself. The long and low head presents a markedly concave profile, rising posteriorly into an abrupt ridge or crest, on which are situated the medium-sized and more or less tube-

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like ears, whose margins are fringed with bristly hairs. Although there is no trunk, the upper lip is frequently produced into a pointed and semi-prehensile tip; and the eyes, which are situated on the sides of the head, are small and pig-like. The cylindrical tail does not reach within some distance of the hocks; and the cows have a pair of teats, situated in the groin.

Very characteristic, too, of rhinos are their teeth, although the number of these varies considerably in the different species, the African members of the group having none in the front of the jaws. In spite of showing minor specific modifications, the grinders, or cheek-teeth, are characterised by a very distinct pattern of grinding surface; the essential elements in those of the upper jaw being a continuous vertical outer wall, from which proceed two transverse crests, separated by a deep open cleft, towards the inner margin of the crown. In some cases the plane of the grinding surface may be nearly horizontal, while in others it is ridged; and the transverse crests and inner surface of the outer wall may be complicated by projections jutting into the median hollow.

Although now confined to Africa and the warmer parts of Asia, rhinoceroses were formerly distributed over the whole of the Old World (with the exception of Australasia), where they ranged as far north as Siberia, and were likewise represented by hornless species in North America. The living species may therefore be regarded as survivors of a very ancient type of animal. All the three species now found in Asia are broadly distinguished from their African allies by the possession of teeth in the front of the jaws, and by their skins being thrown into a number of loose folds, instead of forming a tight-fitting jacket. It is, however, not a little remarkable that India was at one time the home of a two-horned extinct species (*R. platyrhinus*) closely allied, on the one hand, to the living Burchell's rhinoceros (*R. sinus*) of South Africa, and, on the other, to the extinct woolly rhinoceros (*R. antiquitatis*) of Northern Europe and Asia.

The Indian rhinoceros, as the present species may be called, on account of its being confined to India, is the largest of the three Asiatic species, and specially characterised by the possession of a single horn, coupled with the fact that the fold of skin in front of the shoulder is not continued across the back of the neck, and likewise by the skin of the sides of the body being thickly studded with large rounded tubercles, which have been aptly compared to the heads of the rivets in an iron boiler. Very characteristic, too, are the great folds of skin which surround the back of the head like a coif; the head itself being larger and more elevated at the ears than in either of the other two Asiatic species of the genus.

With the exception of a fringe on the margins of the ears, and some bristly hairs on the tail, the coarse and massive skin of this ponderous brute is completely nude, the aforesaid tubercles attaining their maximum development on the shoulders, thighs, and hind-quarters, where they not unfrequently measure fully an inch in diameter. On the limbs the place of these tubercles is taken by a number of small many-sided scales. The main folds in the skin of the body are three in number; namely, one in front of the shoulder, a second behind the same, and a third in front of the thighs and hind-quarters, the second and third of these alone being continued across the back, the first inclining backwards towards the second and dying out on the shoulder. In addition to the aforesaid coif-like folds around the head, a deep horizontal pleat separates the shoulder-shield from the fore-leg, while a similar fold divides the rump-shield from the hind limb. Folds also occur on the hinder border of the rump-shield, so that the tail is neatly enclosed in a deep groove, in such a manner that only its terminal portion is visible in a side view of the animal. The horn, although never attaining dimensions anything approaching those of the front horn of the African species, is well developed in both sexes; and the general colour of the skin is uniformly blackish grey, showing more or less of pink on the margins of the folds.

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A male measured by General A. A. Kinloch stood 5 feet 9 inches at the shoulder, and was $10\frac{1}{2}$ feet in length from the tip of the nose to the root of the tail; the tail itself being 2 feet 5 inches in length. These dimensions are the largest given by Mr. W. T. Blanford in the *Fauna of British India—Mammals*. Much larger dimensions are, however, recorded by Mr. Rowland Ward in the third edition of *Records of Big Game*, in the case of specimens shot by the Maharaja of Kuch Behar; the height in three specimens being respectively 6 feet 4 inches, 6 feet 1 inch, and 6 feet $\frac{1}{2}$ inch; the length of the head and body 11 feet 11 inches, 11 feet 2 inches, and 11 feet 8 inches; and the total length 14 feet 1 inch, 13 feet 2 inches, and 13 feet 10 inches, in the same three examples.

As a rule, the length of the horn does not exceed about a foot. Mr. Rowland Ward records, however, a length of 24 inches in a specimen formerly in the possession of the late Dr. Jerdon, and assigned to the present species; and $19\frac{1}{2}$ inches is the length of a horn in the British Museum. A specimen measuring 19 inches, which comes next on Mr. Ward's list, is stated to be from Burma, and therefore, if the locality be correct, must belong to another species. Three specimens of 16 inches, or over, are recorded from Assam and Kuch Behar. Recently the Maharaja of Kuch Behar obtained a female horn measuring $16\frac{1}{4}$ inches in length, which is the record for that sex.

As regards its teeth, the Indian rhinoceros has usually one pair of upper and two of lower incisors; the outermost pair of the latter being large, tusk-like, and projecting from the angles of the lower jaw, so as to form formidable weapons of offence when wielded by an animal of the weight and strength of the present species. The cheek-teeth are characterised by their flat plane of wear and complex pattern, the former feature being indicative of grass-eating habits on the part of their owner. Teeth of this type have been discovered in Madras and at Bunda, in the North-West Provinces, as well as in the river-gravels of the Narbada

valley, and may be taken to indicate that the range of the species included these parts of India. There is historical evidence to prove that during the early part of the sixteenth century the Indian rhinoceros was common in the Punjab, where it extended across the Indus as far as Peshawur; and down to the middle of the present century, or even later, it was to be met with along the foot of the Himalaya as far west as Rohilcund and Nepal, and it survived longer still in the Terai-lands of Sikhim. Not improbably, too, the rhinoceroses found till about the year 1850 in the grass-jungles of the Rajmehar Hills, in Bengal, belonged to the present species. Now however, this huge animal has retreated almost, if not entirely, to the eastward of the Tista valley, on the borders of Kuch Behar; its main strongholds being the great grass-jungles of that province and of Assam.

In these jungles the Indian rhino (which, by the way, is the rhinoceros *par excellence*, being the type of the Linnean genus of that name) not only dwells, but is as completely concealed therein as is a rabbit in a cornfield. To those who have never seen an Indian grass-jungle, it may seem incredible that such a huge animal should be hidden by such covert, but when it is realised that the grass of which they are formed grows to a height of between 10 and 20 feet, the difficulty vanishes. As a matter of fact, the rhinoceros, like the Indian buffalo, makes regular tunnels, or "runs," among this gigantic grass; and from these retreats it may be driven out by beating with a line of elephants, or by tracking it up on foot. When driven into the open, the animal will often stand for a few minutes, shaking its ears, before it makes up its mind in which direction to flee. A calf and its mother will of course issue forth together, but the old bulls and cows keep mostly apart, although both may have their home in the same patch of jungle. Those who have seen an Indian rhino careering round its enclosure at the "Zoo" after a mud-bath, with its heavy, lumbering gallop, will not fail to realise that a charge from such a monster must be a serious matter. Fortunately, however, in spite of

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stories to the contrary, the creature in its wild state appears to be of a mild and harmless disposition, seeking rather to escape from its enemies by flight than to rout them by attack. When badly wounded, or so hustled about by elephants and beaters as to become bewildered, a rhino will however, occasionally charge home. In such onslaughts it is the common belief that the animal, like its African cousins, uses its horn as its weapon of offence ; but this appears to be one of the numerous popular errors in natural history, and it is stated by competent authorities that the real weapons are the triangular and sharply-pointed lower tusks. With these a sweeping cut can be made in the leg of an elephant, in much the same way as a boar rips up a horse. Probably all the Asiatic members of the genus attack in the same fashion.

Like all its kindred, the Indian rhinoceros dearly loves a mud-bath, and when plastered over with the odoriferous mud of some swamp or pool, is even a more unprepossessing creature than ordinary. Its favourite haunts are generally in the near neighbourhood of swamps ; and hilly districts are studiously avoided by this species. Morning and evening are its chief feeding-times, the heat of the day being generally passed in slumber. As already stated, the structure of its teeth indicates that its food is chiefly grass ; and such observations as have been made confirm the truth of this inference. Individuals have lived for over twenty years in the London "Zoo," and it is stated that others have been known to have been kept in confinement for fully fifty years. Consequently, there is no doubt that the animal is very long-lived, Brian Hodgson suggesting that its term of life may reach as much as a century. The cow gives birth to a single young one at a time, but information is required in regard to the duration of the period of gestation and the frequency with which births take place.

It was an old idea that the hide of the Indian rhinoceros was bullet-proof ; but this was erroneous even in regard to such antiquated weapons as the military "Brown Bess." As trophies, sportsmen may preserve



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PLATE I

- | | |
|-----------------------|--------------------------|
| 1. Indian Elephant. | 4. Sumatran Rhinoceros.* |
| 2. Indian Rhinoceros. | 5. Malay Tapir. |
| 3. Javan Rhinoceros. | 6. Kiang. |

* From a Malay specimen. The Malay animal differs from the chestnut-haired Indian form by its black hair, and probably represents a distinct race (*R. sumatrensis niger*).

either the entire head or the horn alone ; in addition to which a shield-shaped piece of skin is frequently cut from the under surface of the body, where it is thinner than elsewhere, and kept as a memento of a successful "shikar." Kuch Behar is now one of the great centres for rhino-shooting, fine specimens having been obtained by the Maharaja himself. It was in this territory that the Duke of Portland obtained his specimens in 1882. Shooting females is strictly prohibited in Kuch Behar, as it probably also is in Assam.

There is no evidence that this rhinoceros was ever found in Ceylon (where, indeed, the genus is unknown), or in the countries to the eastward of the Bay of Bengal, so that it is one of the comparatively few species of large animals strictly confined to the peninsula of India.

THE JAVAN RHINOCEROS

(*Rhinoceros sondaicus*)

NATIVE NAMES.—*Gainda*, HINDUSTANI ; *Gonda*, BENGALI ; *Kunda*, *Kedi*,
AND *Kweda* OF THE NAGAS ; *Kyeng* AND *Kyan-tsheng*, BURMESE ;
Badak, MALAY

(PLATE I. FIG. 3)

Although possessing but a single horn, the Javan rhinoceros is a very different beast, both externally and in its internal anatomy, to the preceding species. In the first place, although measurements of adult males are still required, it is a somewhat smaller and lighter-built animal, with a relatively less bulky and less elevated head. Then, too, the folds of skin round the neck are much less developed, and the body-fold on the shoulders is continued right across the back in the same manner as are the other two great folds. Moreover, owing to the

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absence of the deep groove on the rump, the tail stands out quite distinct from the hind-quarters, so that its whole extent is exposed in a side view of the animal. Very characteristic, also, is the structure of the skin, which lacks the "boiler-rivets" of the great Indian species, and is marked all over with a kind of mosaic-like pattern, caused by the presence of a network of fine cracks in the superficial layer. A piece of skin cut from any part of the body is therefore amply sufficient to determine to which of the two species it pertained.

Yet another peculiarity of the Javan rhinoceros is to be found in the frequent, if not invariable, absence of the horn in the female. Male horns of between 10 and 11 inches in length are recorded by Mr. Rowland Ward in *Records of Big Game*. In the same work, under the head of *R. unicornis*, reference is made to a horn of 12 inches in length belonging to an individual shot by General Kinloch in the Bhutan Duars. This animal is, however, probably the one alluded to by Mr. Blanford as having been killed in the Sikkim Terai, and assigned to the present species.

As regards the height of the animal, the most authentic measurement of a wild specimen is that of a female, which stood $5\frac{1}{2}$ feet at the shoulder; males must almost certainly attain larger dimensions.

It remains to mention that the present species is of the same dusky-grey colour as the last, and that its hide is equally devoid of hair. Its teeth, although numerically the same as in the Indian rhinoceros, show a simpler pattern in those of the cheek series, while their crowns wear into ridges, instead of a uniformly flat plane. This may be taken to indicate that the present species feeds chiefly upon twigs and leaves.

Typically an inhabitant of Java, this rhinoceros is also found in the islands of Borneo and Sumatra, as well as in the Malay Peninsula, whence it extends northwards through Burma into Assam, and so into Eastern Bengal and the Sandarbans. As already mentioned, it has been killed as

far west as the Sikhim Terai. So far as present information goes, the mainland form cannot be distinguished from those inhabiting the Malay islands, so that separate local races cannot yet be differentiated. It is, however, by no means unlikely that this is due to the want of a good series of specimens; and it may be mentioned, as a circumstance by no means creditable to sportsmen, that at the present time the British Museum has, in addition to skulls and skeletons, only the skin of a young calf in a condition fit for public exhibition.

Although found in the swampy Sandarbans of Lower Bengal, within a day's journey of Calcutta, the Javan rhinoceros usually prefers forest tracts to grass-jungles, and is very generally met with in hilly districts, apparently ascending in some portions of its habitat to an elevation of several thousand feet above the sea-level. In most other respects the mode of life of this species is probably very similar to that of its larger relative; its disposition is, however, stated to be more gentle, and in Java tame individuals are frequently to be seen wandering about the villages of the natives.

HAIRY-EARED SUMATRAN RHINOCEROS

(*Rhinoceros sumatrensis lasiotis*)

NATIVE NAMES.—*Kyan* AND *Kyan-shaw*, BURMESE; *Badak*, MALAY

(PLATE I. FIG. 4)

Although possessed of two horns, the Sumatran rhinoceros resembles its Asiatic brethren in having teeth in the front of the jaws, as well as by its folded skin, and has therefore nothing to do with the African representatives of the family. As compared with the other Asiatic species, the presence of an additional horn, coupled with the fact that

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it has only a single pair of lower front teeth (the small central pair occurring between the tusks in the other two species being absent), afford ample grounds for regarding this rhinoceros as the representative of a group by itself; and it is noteworthy that an extinct rhinoceros whose remains are met with on the continent of Europe appears to be another member of the same group of the genus.

To distinguish the present species from all its relatives, it is really sufficient to say that it is the only living rhino with two horns and a folded skin; but since it is an animal by no means familiar to the majority of sportsmen, it is advisable to enter somewhat into details. In the first place, then, this species has the distinction of being the smallest of living rhinos, as it is by far the most hairy, its usual height at the shoulder not being more than 4 to $4\frac{1}{2}$ feet, and the length from the tip of the muzzle to the root of the tail only about 8 feet. Some female specimens even fall short of the foregoing dimensions, an old individual of the typical race from the Malay Peninsula being only 3 feet 8 inches at the withers. The weight of the animal has been estimated at a couple of thousand pounds.

As though suggestive of a transition towards the smooth-skinned rhinos of Africa, the folds in the skin of the present species are much less pronounced than in the other Asiatic kinds; and of the three main folds, only one, namely, that situated behind the shoulder, is continued across the back. In structure, the outer surface of the skin is finely granular; and its colour, which varies from an earthy-brown almost to black, is likewise quite different from that of either of the one-horned species. Hair is developed sparsely all over the head and body, but attains its maximum development on the ears and the tail, its colour varying from brown to black. At their base the two horns are separated from one another by a considerable interval; and although in captive individuals they are generally much worn down, when fully developed

they are slender for the greater part of their length, the front one curving backwards in an elegant sweep, and attaining a very considerable size. The longest known specimen of the front horn is in the British Museum, and has a length of $32\frac{1}{2}$ inches, with a basal girth of $17\frac{3}{8}$ inches ; a second specimen in the same collection measuring $27\frac{1}{8}$ inches in length and $17\frac{7}{8}$ in circumference.

As regards the cheek-teeth, those of the upper jaw are practically indistinguishable from the corresponding molars of the Javan rhinoceros, and may accordingly be taken as indicative of the leaf and twig-eating propensities of this species.

The Sumatran rhinoceros occurs typically in the islands of Sumatra and Borneo, and is likewise met with in the Malay Peninsula. Thence it extends northwards through Burma and Tenasserim to Chittagong and Assam ; and it also occurs in Siam. Compared with the typical Sumatran animal (*R. sumatrensis typicus*), a specimen from Chittagong, till recently living in the London Zoological Gardens, was found to be distinguishable by its superior dimensions, paler and browner hair, shorter and more fully tufted tail, and the strongly developed fringe on the margins of the ears, the interior of which was bare. The skull, too, was proportionately broader ; but this, in spite of assertions to the contrary, seems to be a feature of minor import. On account of these differences the Chittagong rhinoceros was regarded by its describer, Mr. P. L. Sclater, as a distinct species ; but it can scarcely be regarded as more than a local race, which somewhere in Burma probably passes into the typical form. Other specimens of the hairy-eared race have been subsequently obtained in Assam, where the species is rare ; and one example has been killed in Tippera, and a second in the Bhutan Duars.

In habits the Sumatran rhinoceros appears to be very similar to the Javan species ; both affecting forested hill-country, which may be at a considerable altitude above the sea. In the Mergui Archipelago a rhino,

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which may be this species, is stated to have been seen swimming from island to island ; and it is probable that all the Asiatic representatives of the family will take readily to the water, although in Somaliland the common African rhinoceros is found in absolutely arid districts, where it cannot even drink for long periods.

The type specimen of this race of the Sumatran rhinoceros was a female, captured at Chittagong in the year 1868. When discovered by native hunters she was embedded in a quicksand, and well-nigh exhausted by her struggles to reach *terra firma*. By attaching ropes to her neck she was safely extricated from her perilous position, and securely fastened to a tree, where next morning she was found so refreshed and so violent that her captors were afraid to make a near approach. Accordingly, a report of the capture was sent in to Chittagong, and soon after a couple of English officials arrived with elephants, to one of which the rhino was made fast, and, after some trouble, marched into the station, where she soon became very tame. Eventually she was secured for the menagerie of the London Zoological Society, in whose *Proceedings* for 1872 her coloured portrait appeared. By a lucky coincidence, a specimen of the typical representative of the species was procured by the Society at the close of 1872, so that the two forms were exhibited side by side in the menagerie. While in the docks the Chittagong animal gave birth to a young one ; and from certain facts that came to his knowledge, the late Mr. A. D. Bartlett (who has given an interesting account of the circumstance) was led to the conclusion that the period of gestation in the species was only a little over seven months. She died in the autumn of 1900. It should be added that Mr. J. Cockburn (who wrote on the subject in *The Asian* newspaper of 20th July 1880) is entitled to the credit of recognising that the present form, instead of being entitled to rank as a species by itself, is a local race of the Sumatran rhinoceros ; his view being adopted by Mr. W. T. Blanford in the *Fauna of British India*.

THE MALAY TAPIR

*(Tapirus indicus)*NATIVE NAMES.—*Tara-shu*, BURMESE ; *Kuda-ayer* AND *Tennu*, MALAY

(PLATE I. FIG. 5)

Together with the zebras and wild asses, the tapirs (as they are called by an abbreviation of the native name of one of the South American species) offer but little attraction to the sportsman, since they yield nothing in the way of trophies save their skulls and skins, and the latter are valuable only as leather. Nevertheless, they are animals by no means lacking in interest, if only from the point of view of their very remarkable geographical distribution. Although the common South American tapir was known by repute to the Swiss naturalist Linnè, who at first described it as a terrestrial species of hippopotamus, but afterwards had doubts as to its very existence, it was not till the year 1816 that naturalists were made aware that another species inhabited the jungles of the Malay Peninsula. For this important information they were indebted to a Major Farquhar, who described with some care an individual then living in the menagerie of the Governor-General of India at Barrackpur, although he unfortunately omitted to assign to the Oriental species a distinctive scientific name.

This discovery revealed the singular fact that tapirs are common to the Malay countries and South and Central America, but at the present day are found in no other part of the world. And were it not for the investigations into the past history of the inhabitants of our globe, we should have been at a loss to explain such a very remarkable instance of what naturalists call discontinuous distribution. But the researches in question have revealed the fact that in past epochs these animals were distributed

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over a considerable portion of the northern hemisphere, whence they wandered southwards to their present widely sundered dwelling-places.

Although in Asia, at any rate, animals that but seldom come under the ken of the sportsman in their wild condition, tapirs have been made familiar to the public from the specimens exhibited in our menageries and museums. In size they may be compared to heavily-built and short-limbed donkeys, but from their comparatively bare skins, general shape, and long flexible snouts, they present a superficial resemblance to large swine, with which group of animals many persons are inclined to associate them. An examination of their feet, in which one toe is much larger than either of the others, and symmetrical in itself, is, however, sufficient to show the incorrectness of this idea, and to indicate that their true relationship is with the rhinoceros.

Unlike the latter animals, tapirs have, however, four toes on the front feet, although in the hind feet the number is three in both groups. From the rhinoceroses, the present animals are likewise distinguished by the production of the nose and upper lip into a short, mobile proboscis, or trunk. The teeth, too, are quite different, both in number and form, from those of the last-mentioned groups, their total number being forty-two. Both jaws are furnished with a full set of incisors, or "nippers," and tusks; while the cheek-teeth present a pattern quite different from that obtaining among the rhinoceroses. Tapirs have the tail short, the ears of medium size and oval shape, small, pig-like eyes, and short, sparse hair.

The Malay species, which is the largest of its kind, is readily distinguished from its South American cousins by its parti-coloured hide; the head, limbs, and front part of the body being dark brown or black, while all that portion of the body situated behind the shoulders, including the rump and the upper part of the thighs, together with the tips of the ears, is greyish white or white in the adult. In very young animals, on the other hand, that is to say, those not exceeding from four to six months

in age, the ground-colour is blackish brown or black, upon which are spots and longitudinal streaks of yellow on the head and sides and of white on the under-parts. The hair, too, is markedly denser than in the full-grown animal. In height an adult Malay tapir will stand from 3 to $3\frac{1}{2}$ feet at the withers and about 4 inches more at the rump; while the length from the tip of the snout to the root of the tail, measured along the curves of the body, will be about 8 feet.

The geographical distribution of this animal includes the island of Sumatra and the Malay Peninsula, and thence northwards into the Tenasserim province about as far as the fifteenth parallel of north latitude.

In its wild state, little or nothing authentic has been ascertained with regard to the mode of life of the Malay tapir; and the writer is unacquainted with any account of the chase of this animal by European sportsmen. Its habits, are, however, in all probability very similar to those of the American representatives of the genus. These latter are shy and retiring animals, dwelling amid thick jungle in the neighbourhood of water, to which they take readily. Between the years 1840 and 1896 seven examples of the Malay tapir have been exhibited in the Menagerie of the London Zoological Society. The majority have, however, survived but a short period in that establishment, at least two of them dying within a year of the time of their acquisition.

THE KIANG, OR TIBETAN WILD ASS

*(Equus hemionus)*NATIVE NAME.—*Kiang*, TIBETAN

(PLATE I. FIG. 6)

It was long considered by naturalists that there were at least three distinct species of wild ass in Asia, but fuller materials have led to the conclusion that these are but local races of a single species, the Asiatic wild ass, of which the kiang of Ladak and Tibet is the typical representative, so that its full title should be *Equus hemionus typicus*. The North African and the Asiatic wild asses have by some writers been separated as a genus by themselves (*Asinus*), while their near relatives, the zebras (with which they are intimately connected through the now extinct quagga) have been made the type of yet another genus, under the name of *Hippotigris*. Both asses and zebras differ from the horse by the shorter and upright mane, the less abundant development of long hair on the tail, and likewise by the absence of warty pads on the inner side of the hind-leg, although such are present on the fore-legs of all the members of the family. Such differences are, however, but slight, and it seems better to regard the horse, the zebras, and the asses as respectively representing three subgeneric groups of one and the same genus; the asses being distinguishable from the zebras by the reduction of the dark markings on the body to a dorsal streak and a shoulder-stripe (the latter of which may be wanting), and the unstriped head. It may be added that the comparatively short hairs of the mane of the asses and zebras are annually shed, whereas the long mane-hairs of the horse are persistent. The Asiatic wild ass differs from its African cousin (of which the domesticated breeds

are but more or less degenerate descendants) by the relatively shorter ears and the redder tone of coloration.

In general colour the Asiatic wild ass (inclusive of its various races) varies from a greyish fawn, or isabelline, to bright chestnut on the upper-parts ; the muzzle, throat, chest, under-parts, and inner surface

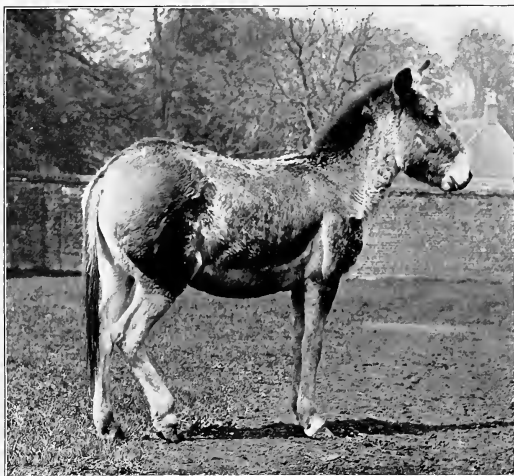


FIG. 2.—The Kiang, from a specimen living at Woburn Abbey.
Photographed by the Duchess of Bedford.

of the limbs being pure white. Along the back, from the nape of the neck to the root of the tail, runs a dark brown stripe of variable width, which has sometimes a whitish margin on each side ; this stripe including the mane, and extending partly on to the tail, the tip of which is blackish. A dark transverse shoulder-stripe may sometimes be present ; and it is stated that faint traces of dark barrings are visible

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on the limbs. The height is given by Mr. Blanford as ranging between 3 feet 8 inches and 4 feet (11 and 12 hands), but Mr. Sterndale states that the kiang may stand as much as 14 hands, this being probably nearer to the truth.

The kiang, or typical race, of the species is specially distinguished by its darker and redder colour, and the narrower dorsal stripe; while it is certainly larger than some representatives of the other races. A mounted specimen in the British Museum, shot in Ladak by Mr. Powell-Cotton, stands 4 feet 5 inches (13 hands 1 inch) at the withers. In summer the coat is short, fine, and sleek, but in winter it is longer, coarser, and curly, with a tendency to a woolly character. Whether similar differences occur between the winter and summer coats of the Baluchi race remains to be ascertained, but it is quite probable that they are not so marked.

The kiang inhabits the higher desert tracts of Ladak and Tibet, from about 13,000 to 18,000 feet above the sea, or even more; and is found commonly in the Chang-chenmo valley, as well as on the Indus itself some few days' march above the town of Leh. Here it is generally met with in small troops, but sometimes singly; and in districts where it has not been much disturbed displays but little fear, galloping in circles round the mounted traveller as he approaches its haunts. Young individuals sometimes display a curiosity which overcomes all sense of fear; one (whose skull is now in the Museum of the Royal College of Surgeons) having on a certain occasion rashly ventured into the writer's camp in Chang-chenmo. Across their rough native country these animals are wonderful goers, their hoofs being as hard as iron; and could they only be properly domesticated, they would be invaluable as beasts of transport across these dreary elevated regions, where ponies often succumb to the climate and want of proper food. Being able to subsist on the scrubby herbage, they would be far more useful than

yaks, which cannot do without grass. But, although the individual at Woburn Abbey whose portrait is here given is fairly amenable to discipline, kiang, as a rule, refuse to submit themselves to the hardships of servitude; the writer having a vivid recollection of the malignant disposition of a specimen kept in captivity by the Governor of Ladak in the seventies.

Much good ink has been wasted by sportsmen in a fruitless discussion as to whether the kiang is a horse or a donkey, the point at issue being whether it brays or neighs. Whatever may be the proper term to apply to its cry (which has been described as a shrieking bray), there can be no doubt, from its bodily conformation, that it comes under the designation of an ass, although in its shorter ears it is a little more horse-like than its African cousin.

As an animal of sport, little can be said in favour of the kiang, as it yields no trophies, and can be easily approached within 150 yards, or even less, when a well-placed Lee-Metford bullet should drop it dead in its tracks, or at all events after a short run. Many sportsmen shoot a specimen or two, and bring back the hide or skull, or both; but this much generally suffices for most men. But in addition to being nothing of a catch for the sportsman, the kiang is very frequently a positive detrimental to those in quest of nobler game, such as argali. By careering wildly about in the neighbourhood of the stalker, kiang render all the animals within sight suspicious of danger, even although their human foe may be most carefully concealed from their view. In such cases an apparently favourable stalk may frequently be brought to an abrupt conclusion by the sudden disappearance of the game, which have taken alarm from the movements of the kiang.

Whether, in the rare atmosphere of the elevated regions in which it dwells, the kiang is as fleet an animal as the wild ass of Baluchistan and Kutch, has not yet been determined. Neither have we, apparently, any

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definite information as to the season when the foals are dropped, and the length of the period of gestation. The latter is, however, probably much the same as in the mare and the domestic ass, and the young are almost certainly born during the summer. Both the wiry grass of Ladak and various dwarf scrubby plants serve as the chief food of the kiang.

THE GHORKHAR, OR BALUCHI WILD ASS

(*Equus hemionus onager*)

NATIVE NAMES.—*Ghor-khar*, PERSIAN AND HINDUSTANI; *Ghur* AND *Ghurdu*, BALUCHI

As already mentioned, the wild ass of Baluchistan and the districts of Western India is only a local race of *Equus hemionus*, and not a species by itself. From the kiang, or typical representative of the species, it is distinguished by its duller and less rufous colour, and also by the greater breadth of the brown stripe down the back, which is always distinctly margined on both sides by a narrow white or whitish line. An adult female shot by Mr. W. T. Blanford in 1882 measured 3 feet 10 inches at the withers.

The ghorkhar is a dweller in the sandy deserts of Afghanistan, Baluchistan, and other districts on the west of the Indus,—Mithankot, on the Punjab frontier, being a noted locality for these animals. But they are by no means restricted to the trans-Indus districts, a certain number being met with to the eastward of that river, in the Bickanir desert, Jesalmere, and that dreary tract of salt-pans known as the Rann of Kutch. From Baluchistan, where they are comparatively rare, wild asses extend into Persia and Syria; the Persian form (*E. hemionus hemippus*) being regarded by naturalists as a distinct race, although evidently very close to the ghorkhar, with which, indeed, it probably intergrades.

The Baluchi wild ass appears to be a much more gregarious animal than its Tibetan relative, thirty or forty head being frequently seen in a troop; and Dr. J. Aitchison, when on the Afghan Delimitation Commission, states that in North-Western Afghanistan, during the month of April, he encountered a troop which he estimated to include about a thousand individuals.

In the trans-Indus districts the mares of this race give birth to their foals during the summer, from June to August. The horsemen of the Rann of Kutch appear to take advantage of the mares when in foal by riding them down and spearing them; Mr. Blanford believing that this feat (which is certainly practised) could not be accomplished under any other circumstances, on account of the extreme fleetness of these animals. Baluchis, mounted on their swift mares, capture young ghorkhar by riding after them in relays, sometimes with the aid of greyhounds, until they succumb from sheer exhaustion. Probably in certain parts of their habitat, such as the Rann of Kutch, where, at certain seasons, there is no water but such as is salt, ghorkhar must go for considerable periods without drinking. Like the kiang, these wild asses, in spite of their fleetness of foot, are by no means well-bred-looking animals, the head being disproportionately large and heavy, as well as ungracefully carried.

THE GAUR, OR (SO-CALLED) INDIAN BISON

(Bos gaurus)

NATIVE NAMES.—*Gaur* AND *Gauri-gai*, HINDUSTANI ; *Gayal* IN ORISSA ; *Gaor* (male) AND *Gaib* (female) IN CHUTIA NAGPUR ; *Sainal*, HO-KOL ; *Gaviya*, MAHRATHI ; *Pera-mao* OF THE SOUTHERN GONDS ; *Katurimai*, TAMIL ; *Karkona*, *Karti*, *Kard-yemme*, *Kard-korna* AND *Doddu*, CANARESE ; *Karthu* AND *Paothu*, MALABARI ; *Mithan*, ASSAMESE ; *Selori* IN CHITTAGONG ; *Pyung*, BURMESE ; *Saladang*, MALAY

(PLATE II. FIGS. I, 1a)

In addition to the foregoing sufficiently heavy list of designations, the great wild ox of India is frequently called in various parts of the peninsula by several names meaning wild buffalo. By English sportsmen, on the other hand, this magnificent animal is almost invariably called bison—a title properly belonging to *Bos bonasus* of Lithuania and the Caucasus. Questions are sometimes asked in sporting newspapers whether the application of the term bison to the gaur is legitimate. The answer is very simple, namely, that it is not. Domesticated oxen (together with their extinct wild progenitors), gaur and gayal, bison, yak, and buffaloes collectively constitute the ox tribe. And since the domesticated ox is the type of the whole group, they may all, in a general sense, be classed as oxen. Had the bison of Europe been made the typical representative of the group, then that term might likewise have been employed in the same general sense, and the gaur termed a bison as it now is an ox. But as matters stand, such a usage is totally indefensible. The true domesticated oxen form one division of the group. Next to this comes a second and nearly allied section of the group comprising the gaur, the gayal, and the banting ; all the members of which



FIG. 3. A Bull Gaur killed by the Mahuraja of Kuch Behar.

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are characterised by their elevated withers, short hair, and "white-stockinged" limbs. The third section includes the European and American bisons (the former commonly miscalled aurochs, and the latter buffalo), with which the yak may perhaps be included, all these having long hair on some part of the body, uniformly dark limbs, and lacking the ridge-like hump of the second section. Lastly, there are the buffaloes, differing from all the others by the peculiar form of their horns. Each sectional group is perfectly well defined, and it would be just as logical to call the gaur a buffalo as to dub it a bison. But since there are few things more difficult to amend than popular misapplications of names, a bison it will probably remain among sportsmen for many years to come.

Of the general characteristics of the ox tribe but little need be said here. With the exception of a few stunted island forms, the members of the group are large and heavily-built animals, with a short and deep neck, a massive head, carried somewhat low, and frequently a large dewlap on the throat and chest. The broad muzzle is devoid of hair, with a moist skin; there are no glands on either the face or the legs or between the hoofs; and the udders of the cows have four teats. The horns (which, in common with those of the members of the family *Bovidae*, form a transversely situated pair, and consist of hollow sheaths of horn surmounting conical bony cores arising from the skull) are present in both sexes, and not very much smaller in the cows than in the bulls. They are placed on or near the vertex of the skull, where they are usually widely separated at the base. Their direction is at first more or less outwards, after which they curve upwards, and generally more or less inwards towards the tips. Although cylindrical in the more typical members of the group, in the buffaloes they become distinctly triangular in cross-section; and while in the former they are almost completely smooth externally, in the latter they are marked with irregular transverse groovings and ridges. In colour the horns may be of any shade between olive-green and black. The ears are of medium

size and bluntly pointed ; and the long cylindrical tail is generally tufted at the tip, although in some cases long-haired throughout its length. In regard to the length and abundance of the coat, there is every gradation from the sparsely-haired hide of the buffaloes to the long-haired pelt of the yak ; there is little or no seasonal difference in the colour of the coat, which, with the occasional exception of the lower portion of the legs, and very rarely of the buttocks, is uniform. Lastly, it is important to mention that the oxen are specially characterised by the square prismatic form of their long-crowned cheek-teeth.

The group of wild oxen of which the gaur is the best-known representative is confined to the Indo-Malayan countries, and includes three species presenting a number of characters in common. Compared with the ancient wild ox of Europe, skulls and skeletons of which are preserved in our museums, these Oriental oxen are distinguished by the shorter forehead, the nearer approximation of the eyes to the base of the horns, a more or less marked compression of the horns, especially near the base, and the relatively shorter tail, the tufted tip of which hangs but little below the level of the hocks. More important, perhaps, than all, is an elevated ridge extending from the neck and shoulders to the middle of the back, where, in its most developed condition, it forms a sudden step-like descent towards the loins. In old bulls the colour is generally blackish brown, but in cows and young bulls either a paler shade of the same or red ; the legs, from above the knees and hocks downwards, being, in both sexes and at all ages, white or yellowish. All the three species have short sleek coats, without a mane or long hair on the withers ; the hoofs in all are narrow and game-like ; and the number of pairs of ribs in the skeleton is thirteen.

Although artists, who have for the most part to make their sketches from stuffed specimens, are only too apt to give it a meek and mild expression, like a Jersey cow, the bull gaur is one of the boldest and handsomest members of the ox tribe, the late Mr. G. P. Sanderson even going so far

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as to say that it "is undoubtedly the finest species of the genus *Bos* in the world." Standing occasionally as much as 6 feet or even 6 feet 4 inches (19 hands)¹ at the withers, although frequently not exceeding 5½ feet, the bull gaur is at once distinguishable from all its relatives by the great arched and forwardly-curving crest, which communicates a marked and distinctive concavity to the profile of the forehead, of which there is no trace in any other species. The massive horns, which are much flattened from back to front at the base, where they are marked by exfoliating rings, spread outwards from each side of this broad crest in a bold sweep, the curve continuing throughout their length, with the tips, when perfect, inclining inwards and slightly backwards. Very frequently, however, one or both tips are broken off during the fierce combats for supremacy in which the bulls are wont to engage. In colour the horns are pale greenish or yellowish for the greater portion of their length, gradually passing into black at the tips. Horns of 30 inches and over along the curve may be regarded as fine trophies, Mr. Rowland Ward recording only twenty-one specimens in which the measurement mentioned is exceeded. The "record" specimen has a length of 39¼ inches along the outer curve, with a basal circumference of 20¼ and a tip-to-tip interval of 18¾ inches; this specimen, which came from Salwen in Burma, being in the Museum of the Natural History Society of Bombay. In the next biggest, which is from Travancore, the three dimensions mentioned above are respectively 39, 19¼, and 18¼ inches. The curve-lengths of the next four specimens on the list are respectively 35, 34¾, 34, and 33¾ inches.

Regarding other features in the personal appearance of the bull gaur, it may be mentioned that while his ears are relatively large and spreading, his tail is comparatively short, only just reaching the hocks; the dewlap,

¹ Mr. Stuart-Baker (*Asian*, 27th February 1900) says that gaur may stand 21 hands (7 feet) in Kachar. A similar statement is made by Colonel Pollok with regard to the Burmese representative of the species, and this is confirmed by Mr. Bruce in the sequel.

too, is, in Indian specimens at any rate, but slightly developed.¹ A very marked character is the strong development of the dorsal ridge, and its very sudden termination in a step about midway between the shoulders and the root of the tail. The general colour of the short and sleek hair, which becomes very sparse on the back of aged bulls, is olive brown, tending almost to black ; on the under-parts it becomes paler, but is golden



FIG. 4.—Skull and Horns of Cow Gaur. From a specimen in the possession of Mr. A. O. Hume.

brown at the points of origin of the legs ; the forehead, from between the eyes across the horn-crest, and so on to the nape of the neck, is ashy grey, in some instances passing into whitey brown or dirty white ; the muzzle is pale slate-coloured ; and the lower portions of the limbs, from above the knees and hocks downwards, are pure white. The iris of the eye is, in

¹ In the Appendix Mr. Bruce states that full-grown Burmese bull gaur, which he describes as black, have a distinct dewlap. This may indicate that the Burmese form is a distinct race.

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both sexes, light blue. In cows and young bulls the general hue is somewhat paler, in some cases, especially during winter and in dry and open districts, tending to rufous. Calves have been said to show a dark dorsal streak. The horns of the cows (Plate II. Fig. 1*a*) are smaller, thinner, and less expanded than those of bulls. The longest pair of gaur horns definitely recorded as those of a cow are from Travancore, and are represented in the annexed text-figure. They measure 24 inches in length along the outer curve, $13\frac{1}{4}$ in basal circumference, and 13 between the tips. Other specimens have been recorded, of which the respective lengths are 22, $20\frac{1}{2}$, and $19\frac{1}{2}$ inches.

Being essentially forest-dwelling animals, gaur are not, for the most part, found in the tall grass-jungles of the Ganges plain, which form the home of the Indian buffalo and rhinoceros, although they impinge to a certain extent into this tract along the foot of the Himalaya. Their ordinary resorts are the extensive tracts of hill-forests occurring in many parts of India, Burma, the Malay Peninsula, and very probably also of Cochin China and Siam. At the present day these fine cattle are quite unknown in any of the Indo-Malayan islands, although there is a tradition to the effect that they formerly occurred in Ceylon ; but even if such were really the case, it is quite likely that they were introduced into that island. The north-western range of the species in India is probably limited by the Rajpipla Hills, in the neighbourhood of Broach ; while to the west of the eightieth parallel of latitude the northern limit is very nearly coincident with the line of the Narbada valley. Along the foot of the Himalaya gaur are found in the forest tracts as far westward as Nepal ; while to the southward of the Ganges valley they survive in many of the forests of Chutia Nagpur, Orissa, the Northern Circars, the Central Provinces, Hyderabad, Mysore, and the Western Ghats, although from some localities they have already disappeared, and are becoming scarcer in others.

Whether gaur from the countries to the eastward of the Bay of

Bengal present such constant differences from the Indian animal as to entitle them to be regarded as representing a distinct local race cannot yet be determined, the number of specimens in our museums being insufficient for this purpose. It may be added that unless these institutions are "run" on very different lines from those now followed, the question is likely to remain open. The Burmese gaur has been said to be a taller animal (attaining close on 21 hands at the shoulder, according to one sportsman), with the ridge on the back extending farther towards the rump, the hollow in the forehead deeper, the crest between the horns higher, and the horns themselves heavier and thicker, with their tips seldom worn. The profile, too, of the lower portion of the face is stated to be more convex and ram-like than that of gaur from the Wynad district; but in this respect bulls from the Western Ghats are said to be much more like Burmese examples. As regards the skull, any large series will undoubtedly display very considerable variations—some specimens from Northern India even showing, as mentioned more fully below, an approximation towards the gayal type; but there is at present no decisive evidence that such variations, apart from the approximation to the gayal type, are correlated with locality.

Then, again, there is a question in regard to the dewlap, which, although in most cases practically wanting, is stated to be developed in certain individuals of the Travancore herds. Since, however, according to the last statement, it is, at most, only an individual peculiarity, its importance is obviously much less than that of the alleged local differences noted above.

The fact that cows and young bulls inhabiting dry and more open districts are less darkly coloured than those from dense and damp forests is an example of a very common feature among animals.

In spite of its bulk and heavy build, the gaur is almost as active as a cat in getting over rocky country (which is the ordinary resort of the

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species); and the manner in which a herd will make their way up an impossible-looking hill-side is little short of marvellous. Although, as already said, generally found on forest-clad hills, gaur are sometimes to be met with on the plains; and in Mysore and the Wynad district they frequent rocky hills, whose flattened, open summits afford excellent grazing-grounds, the herds ascending to elevations of from 2500 to 6000 feet above sea-level.

In the Narbada district the habits and *shikar* of gaur have been admirably described by Captain Forsyth in his *Highlands of Central India*, while Mr. G. P. Sanderson, in *Thirteen Years among the Wild Beasts of India*, has done the same for the Mysore country. Gaur are seldom seen in herds of more than twenty head, and more frequently in small parties of from five to ten. In the Western Ghats, and doubtless in other districts, they are generally to be found on the open grass-tracts for some hours after the early morning feed, but as the sun increases in power they one by one rise to their feet and seek shelter in the surrounding forest. When driving is resorted to, the beaters should not be allowed to commence their work till the herd has in this manner betaken itself to covert; as if driving is attempted while the animals are in the open, failure will almost certainly ensue. Moreover, it is important to ascertain that no stragglers have been left lying down in the open. The alternative to beating is by following up the animals with the aid of native trackers, such as the Bhils and Gond.

Although the finest bulls are completely solitary, a certain number of their sex keep with the herds. In writing of the herds, Mr. Sanderson says that their members "are shy and retiring in their habits, and retreat at once if intruded upon by man. They avoid the vicinity of his dwellings, and never visit the patches of cultivation in the jungle, as do wild elephants, deer, and wild hog. . . . The food of the gaur,¹ as of

¹ In these extracts "Gaur" is substituted for "Bison."

the wild elephant, consists chiefly of grasses, and only in a secondary degree of bamboo-leaves and twigs, the thick and succulent tuberous shoots of the bamboo which appear during the rains, and of the bark of some trees. . . . Gaur feed till about nine in the morning, or later in cloudy and rainy weather ; they then rest, lying down in bamboo-covert or light forest till the afternoon, when they rise to graze and drink ; they also invariably lie down for some hours during the night. Although certainly quick in detecting an intruder, gaur can scarcely be considered naturally wary animals, as they seldom encounter alarms. Unsophisticated herds will frequently allow several shots to be fired at them before making off, and even then probably will not go far. But if subjected to frequent disturbance, they quickly become as shy as deer. . . . I have never known a case of herd-gaur attacking man, except such individuals as were wounded, and, being pursued, found themselves unable to escape."

The narrator then proceeds to state that in many of their habits gaur resemble elephants, and that herds of both may not infrequently be seen feeding together. Solitary bulls, which often show their age by the number of scars they bear on their nearly hairless hides, have a bad reputation for ferocity, being commonly reported to charge without provocation. While admitting that this is to a certain degree the case, Mr. Sanderson accounts for it by their greater liability to being suddenly surprised while reposing than are the members of a herd, some of whom are always on the watch. And when thus surprised, like other animals, they not uncommonly "go for" the disturber of their slumbers.

The following measurements of gaur horns from Northern India are given by Mr. Stuart-Baker, and may prove of interest to sportsmen.

In one head the dimensions are :—

"Tip to tip round sweep.	75	inches.
Base of right horn in girth	22 $\frac{3}{4}$	"
„ left horn	22 $\frac{5}{8}$	"
Greatest expanse	47	"

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“Measured ten days after being shot.

“Another longer but lighter head measures—

Tip to tip round sweep	86½ inches.
Base to tip of right horn	37 ”
„ „ left horn	37½ ”
Girth of right horn at base	19½ ”
„ left „	19¼ ”
Greatest expanse	53 ”

“These two represent the stoutest and longest horns, respectively, I have ever seen, and were both shot by myself.

“Another very fine head which was killed in a gun trap and brought to me by a Kuki, and is now in the possession of Mr. F. Bott, measures—

Tip to tip round sweep	74 inches.
Girth of right horn at base	20¾ ”
„ left „ „	20½ ”
Widest expanse about	56 ”

“This was measured dry, and would probably have measured close on 22 inches round the bases of the horns if measured fresh. I have known no head with such a magnificent expanse as this one showed, though one or two have approached it rather closely.”

THE GAYAL, OR MITHAN

(Bos frontalis)

NATIVE NAMES.—*Gayal*, or perhaps preferably *Gaial*, HINDUSTANI; *Mithan*, *Bunerea-goru*, AND *Gavi* OR *Gabi*, ASSAMESE AND IN CHITTAGONG; *Sandung*, MANIPURI; *Shel* OR *Shio* OF THE KUKIS; *Jhongnua* OF THE MUGHIS; *Bui-sang* AND *Hui* OF THE NAGA TRIBES; *Phu* OF THE AKAS; *Siba* OF THE DAPHLA HILL TRIBES; *Nani* AND *Tsaing*, BURMESE

(PLATE II. FIGS 2, 2a)

If it really exist in the wild condition at all—a question in regard to which a certain amount of scepticism is permissible—the gayal is one of the comparatively few animals coming under the designation of big game that have seldom or never been “bagged” by the British sportsman. The only definite record that we have of such a “bag” is the case of an apparently wild gayal shot in Tenasserim by the late Mr. W. Davison, who formerly collected for Mr. A. O. Hume, in whose possession is the skull of this particular animal. But there may be a question whether this gayal was really truly wild, or merely one that had escaped from domestication and taken to a life in the woods. The circumstances that apparently tell most strongly against the former view is that since the specimen in question no other wild gayal has been recorded from Tenasserim, while in every other part of their habitat these cattle are known only in the domesticated condition; but, on the other hand, it must be remembered that the fauna of the interior of Tenasserim is but very little known, and the gayal may be wild there although domesticated elsewhere.

If the gayal be a truly wild animal—whether or no it exists in that

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condition at the present day—there can be, of course, no question as to its right to be regarded as a distinct species, or race. But if, on the other hand, it is nothing more than a domesticated breed, then it is highly probable that it is merely an artificial derivative from the gaur. And, as already mentioned, certain skulls of the latter are known which exhibit in some degree an approximation towards the gayal type of cranium, but these may be half-breeds.

Although a magnificently-built creature, the bull gayal never attains the same dimensions as the gaur, from which it differs by the shorter limbs, the somewhat less elevation of the dorsal ridge, the great development of the dewlap, and the form of the skull and horns. In place of the arched intercornual ridge and concave frontal profile of the typical gaur, we have in the typical gayal a perfectly straight line on the vertex of the skull between the widely-separated horns, while the entire forehead is flat and of great relative width and shortness. The horns, too, which are mostly of a blackish hue, more or less mingled with yellow, show only a slight curvature, inclining outwards and somewhat upwards, without trace of a terminal inward sweep. In the skull the marked shortness of the nasal bones forms a notable point of distinction from the gaur. As regards colour, the gayal is a distinctly darker animal than its relative, the whole of the upper-parts, with the exception of the forehead, which is frequently tawny, being in both sexes blackish brown; the legs, from above the knees and hocks downwards, showing the usual white or yellowish "stockings." In the domesticated condition parti-coloured, or even wholly white, gayal are stated to be by no means uncommon.

Since the foregoing remarks were penned an important communication on the gaur and gayal, by Mr. E. C. Stuart-Baker, of Kachar, has appeared in the columns of *The Asian* newspaper of the 20th and 27th of February 1900. This communication is illustrated with numerous figures of skulls of both animals; and since its author has had unrivalled

opportunities for studying them, his conclusions are worthy the best attention of naturalists and sportsmen.

Mr. Stuart-Baker commences his article by stating that he has studied the two animals for upwards of thirteen years. "During the first two or three years of this period," he writes, "I held the opinion that they were identical. After this I veered round a good deal, and began to think that the reasons for considering them distinct might be right ; this because I



FIG. 5.—Skull and Horns of a Bull Gayal from Tenasserim. In the Collection of Mr. A. O. Hume.

quite failed to obtain certain necessary links between the two forms. The last two or three years, however, have produced specimens which have shown every one of these same links, and I am now forced to the conclusion that there is no difference of specific value between the two animals, such differences as do exist being principally, if not entirely, the result of domestication."

This latter sentence, it may be remarked, is not quite what a scientific naturalist would have written. What is really meant would seem to be that the characters in which the typical gayal differs from the typical gaur

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are the results of domestication. Although several of the figures of gaur skulls given are those of immature animals in which the characteristic adult features are not attained, yet there does seem considerable evidence of a transition between the typical cranial forms of the two animals—a transition of which the present writer has already had partial cognisance.

Such a transition does not, however, by any means invalidate the features given above as characteristic of the two animals—such features being those of their typical representatives. And it may be added that, so far as the present writer's knowledge goes, it is only in the Kachar and Assam districts that skulls intermediate between the typical gaur and the typical gayal are met with; the Madras gaur preserving, when fully adult, the distinctive peculiarities of that animal in all cases.

Summing up the evidence, it seems that the gayal is not definitely known to exist in a truly wild condition in Northern India, where there is a more or less complete transition in respect of cranial character from the typical gaur to the typical gayal, and that these intermediate specimens may be due to crossing. This, however, by no means necessarily leads to the conclusion that wild gayal never existed anywhere. And it is quite possible that Tenasserim may have been their original home, whence they were transported north in a domesticated condition. The difference between typical gaur and typical gayal skulls is so great that it is difficult to believe it can be the result of domestication.

Horns of pure-bred gayal measuring 15, $14\frac{1}{2}$, 14, and $12\frac{5}{8}$ inches in length are on record; the respective basal circumference of these being $11\frac{1}{2}$, $13\frac{1}{2}$, 14, and $13\frac{1}{4}$ inches, and the tip-to-tip interval of the first, second, and fourth of these specimens being $26\frac{3}{8}$, 28, and $27\frac{3}{4}$ inches.¹ Some larger measurements are noted below, but it is uncertain whether these are from typical animals.

¹ In *Wild Oxen, etc. of all Lands*, p. 33, the tip-to-tip interval ($27\frac{3}{4}$) is inadvertently given as the basal girth ($13\frac{1}{4}$) of one of these specimens.

Putting on one side the question whether gayal are ever found in a truly wild state, in a domesticated or semi-domesticated condition these splendid animals are met with among certain tribes both to the north and south of the Assam valley, in the neighbourhood of Manipur and Kachar, as well as in hill Tipperah, Chittagong, and the Lushai hills as far south as Chittagong itself. Many, or all, of these domesticated gayal are allowed to run by themselves through the forest, returning to the villages of their owners at nightfall.

Horns of cow gayal (Plate II. Fig. 2*a*) are much more slender than those of the bulls.

The following dimensions of tame gayal (or of animals intermediate between typical gaur and typical gayal) are taken from Mr. Stuart-Baker's paper.

In one bull the measurements are :—

“ Round sweep from tip to tip	.	.	.	$42\frac{1}{2}$ inches.
Length of right horn	.	.	.	14 „
„ left horn	.	.	.	14 „
Girth of right horn at base	.	.	.	$17\frac{1}{4}$ „
„ left „ „	.	.	.	$17\frac{1}{2}$ „
Tip to tip of horn, straight	.	.	.	31 „

“ Another bull very similar in general shape to the last measured—

Round sweep from tip to tip	.	.	.	48 inches.
Length of right horn	.	.	.	$17\frac{1}{4}$ „
„ left „	.	.	.	17 „
Girth of right horn at base	.	.	.	15 „
„ left „ „	.	.	.	15 „
Tip to tip in a straight line	.	.	.	33 „

“ A young bull, which would probably have become in two or three years an abnormally fine specimen, taped—

Round sweep from tip to tip	.	.	.	58 inches.
Length of right horn	.	.	.	22 „
„ left „	.	.	.	$22\frac{3}{4}$ „

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Girth of right horn at base	.	.	.	12 $\frac{1}{2}$ inches.
" left " "	.	.	.	12 $\frac{1}{2}$ "
Tip to tip in a straight line	.	.	.	42 "

"A cow rather above the average measured as follows :—

Round sweep	.	.	.	.	41 inches.
Right horn	.	.	.	.	15 "
Left horn	.	.	.	.	16 "
Girth at base	.	.	.	.	10 $\frac{1}{2}$ "
Tip to tip	.	.	.	.	25 $\frac{3}{4}$ "

"The horns first mentioned in these measurements are bigger round the base than any others I have seen and measured, but one which I saw in a Naga village on a sacrificial pile was much stouter as well as longer, and this, I should think, would have measured close on 19 inches round the bases. The Nagas, however, refused to sell it, and I had no tape then to measure it with. I have seen none, so far as I remember, which were purely of the domestic type, with horns as long as those of the third specimen."

THE BURMESE BANTING

(*Bos sondaicus birmanicus*)

NATIVE NAMES.—*Tsaing* OR *Hsaing*, BURMESE ; *Banting* AND
Sapi-utan, MALAY

(PLATE II. FIG. 3)

The tsaing, or banting (for the name sapi-utan, meaning forest-ox, is applied by the Malays alike to this species and the little anoa of Celebes), is the characteristic wild ox of the Malay countries ; and although belonging to the same group as the gaur and the gayal, it displays some of the distinctive characters of the group in a less marked degree, and thus departs less

widely from the common ox. It has, for example, the ridge on the withers much less developed, and not terminating posteriorly in a distinct step; while the cows, and in the Burmese race the bulls also, are reddish coloured. Perhaps the two most distinctive features of the species are the horny callous shield on the vertex of the head between the bases of the horns, and the large white patch on the buttocks, which surrounds, although it does not include, the root of the tail. Standing from about 5 feet to at



FIG. 6.—Freshly killed Head of Bull Burmese Banting, or Tsaing. From a specimen shot by Mr. R. McD. Hawker.

least 5 feet 9 inches in height at the withers, the banting is a rather lighter-built animal than the gaur, with a less massive and more elongate form of head. The dewlap is but imperfectly developed, the well-tufted tail descends somewhat below the level of the hocks, and the ears are proportionately smaller than in either the gaur or the gayal. Compared with those of the former animal, the horns of the bull banting are comparatively slender and more nearly cylindrical; the only compression being found at the base of those of fully adult individuals. They are more or less rugged near their origin from the head, but are smooth for the remainder of their

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length. At first the direction of their sweep is outwards and somewhat upwards, but towards the tips they take an inward and slightly backward curvature. In the dried skull their bases are seen to flange out in a characteristic manner. In the cows and young bulls the general colour of the short and sleek hair of the upper-parts is reddish brown, approaching chestnut : the under-parts being much lighter coloured, sometimes even whitish or white, as are the inner surfaces of the ears, the lips, the inner side of the legs, and the rump-patch. The legs, too, in adult cows are white from above the knees and hocks downwards to the hoofs, although in calves their outer sides are chestnut, like the body ; a dark streak also running down the middle of the back. Except in the case when the rump-patch is wanting, the general distribution of colour is the same in adult bulls as in full-grown cows, but the tint of the upper-parts may be of almost any shade between dark reddish brown and blackish brown.

The typical representative of the banting is an inhabitant of Java, but an identical or nearly allied form is met with in Bali, Borneo, probably Sumatra, and perhaps the Malay Peninsula ; the adult bulls of this typical race having the dark area of the upper-parts blackish brown or even black, and the forehead and face coloured like the back.

Not so the Burmese banting, in which the general colour of the upper-parts in the adult bull is described (for the British Museum has no complete wild specimen of this race) as dark chestnut, appearing darker in some lights than in others, and shading off into light brown below. The face, as exemplified by a mounted head in the British Museum, is tawny grey, with a light chestnut patch some distance above the muzzle ; the margin of the lips and the inner surface of the ears being whitish, and the muzzle blackish. The head of a bull shot by Mr. Bruce in Upper Burma is very similar in colour to the Museum specimen, but more uniformly tawny. With the exception that the upper part of the fore-legs is darkish grey, the rest of the coloration is similar to that of the typical

race. Young bulls, in which the white markings are less distinct, are lighter and brighter in colour. At all ages the cows are of a bright reddish chestnut, with the face somewhat paler than the back, especially on the forehead, round the eyes, and near the muzzle, where, like the under-parts and the lower portion of the legs, it becomes dirty white. The specimens of which the height has been recorded do not run so large as the typical Malay race, a bull standing 5 feet $4\frac{1}{2}$ inches, and a cow 5 feet 1 inch at the withers. In the notes quoted below it will be seen that there are considerable variations from the above type of coloration, but in no instances are the bulls described as being black.

The Burmese variety of the banting is found in Burma, Pegu, and Arakan, whence it may perhaps extend southwards to the Malay Peninsula, and northwards to the hill-ranges east of Chittagong. Banting also occur in Manipur, but these, as mentioned below, may belong to another race of the animal. For accounts of the Burmese banting we are chiefly indebted to Captain Evans, and Mr. C. W. A. Bruce, who wrote in *The Asian* newspaper of 10th October 1899 under the initials C. W. A. B.

The latter writer observes that the Burmese distinguish three varieties of tsaing, viz.—

“(a) The common light red bulls and chestnut cows called by them Hsaing Bya.

“(b) Dark chocolate bulls and cows darker chestnut than in variety (a); Hsaing Nyo of the Burmans; sometimes this variety is spoken of as Hsaing Mwe.

“(c) Dark-faced bulls with red bodies, Hsaing Ni of the Burmans. I have shot bulls of all three varieties, and the differences are well marked, especially so in the case of the hsaing nyo, which, except in shape and in the position of the white markings, might be another species altogether.

“All three varieties inhabit the same kind of jungle and may be found in the same forest, but I have never seen herds containing two of the above

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varieties in the same herd. All herds I have seen have consisted of individuals of one variety only."

Since all these so-called varieties occur in the same area they cannot be regarded as local races, although the alleged differences in the colour of the different herds is certainly very remarkable.

In all parts of its habitat the banting frequents less hilly ground than the gaur, and is more often found in grass-jungles, or grass-jungles with scattered trees, than in thick forest.

The following notes on the habits of the Burmese banting are abbreviated from the excellent account given by Mr. Bruce. "During the hot weather," he writes, "these animals wander about the plains of Engdaing forest, consisting mainly of the In-tree (*Dipterocarpus tuberculatus*). This tree is gregarious and usually has an undergrowth of coarse grass, 'Thekai' (*Imperata cylindrica*), or 'Kaing' (*Saccharum sp*). All engdaing forests are broken up by open expanses devoid of tree-growth, but covered with thekai grass. Such places are known to the Burmese as 'Kwins'; depressions between plateaux in the engdaing devoid of tree-growth also occur. These are usually covered with kaing grass. In April the grass, as a rule, gets burnt off by forest fires, and it is to eat the tender young shoots of the new growth of the two varieties of grasses that the hsaing frequent the plains, though they are also found in these places at other times of the year, particularly in the cold weather. They also eat leaves, shoots of bamboos, and fruits of trees, but they prefer grass. In the hot weather this engdaing forest is a sure find for hsaing. They occasionally go into the foot-hills, if there are any adjoining, to sleep during the day, descending again about 4.30 P.M., and returning at about 9 A.M. But I have found hsaing feeding in the middle of the day in the very height of the hot weather, and also found them sleeping in the engdaing, under the very sparse shade of a big in-tree. I have never found hsaing go high up into hills, and doubt if they ever go much above 2000 feet above sea-level.

In the rains, when the new bamboo-shoots are sprouting, they leave the engdaing entirely, and frequent bamboo-forest to feed, like many other animals in Burma, on these shoots. They, I think, feed mostly at night, but also at intervals throughout the day, and don't seem to mind heat at all. They undoubtedly drink, and are very fond of frequenting salt-licks, and also licks of a peculiar light grey earth (*myehnan*), the 'smelling-earth' of the Burmans. This earth is found usually in the banks of dry nalas in the engdaing, and the hsaing scrape deep holes in it with their tongues. Bulls, especially solitary ones, are very fond of butting down young trees along the path they may be travelling, and the strength exerted to break some of these must be considerable. I have never heard a hsaing calling like gaur do, and the Burmans say they do not make any sound, except the snort of alarm or warning. This is very similar to that made by the gaur, but, instead of being double, is only a single snort; on alarming a herd one often hears more than one snort, but after careful observation, I am inclined to think these are made by different individuals. The snort is more prolonged than the gaur's. I once came across a young hsaing asleep in a patch of unburnt grass in engdaing jungle; it bolted off in the direction which the numerous footsteps indicated that a herd had travelled. This was in May, and I fancy the animal was very young, and had been hidden by the mother while the herd went on grazing. All, or rather nearly all, herds I have found in April and May have young calves with them, so I presume that the young are born at the end of the cold and beginning of the hot weather. The sense of smell in hsaing is very keen; I should place hearing as second, and sight a bad third, as I have often suddenly seen hsaing, and noticed them looking at me, but on my standing perfectly still they have either gone on grazing or moved slowly away; this was always when the wind was favourable. Solitary bulls are more wary than herds, and on being disturbed usually dash straight off and travel considerable distances. Herds, however, snort on being alarmed,

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dash off for 100 yards or so, and then stop for a few seconds to look round. I have often bagged a bull by directly hearing the snort. Running hard in the direction taken by the herd, the bull generally brings up the rear and acts as whipper-in of the flying animals. If a herd is followed, my experience is that one can always come up with them within two hours at the most. I have fired twice within twenty minutes at the same herd, and once I came up with the same herd four times in the same day, though I did not bag the bull. I do not think them particularly dangerous; I have never been charged by one, and Burmans show less fear of hsaing, wounded or unwounded, than they do of his cousin the gaur. But they tell blood-curdling yarns of charging hsaing in 'Burma min letet,' *i.e.* the king's time; but then, as they used muzzle-loaders that necessitated crawling up to within a few yards of the animal, no wonder they got frequently knocked over. I have only twice seen a hsaing bull prepare to charge, and each time, as the ground was open, I was able to stop such intentions. The last time, as I had an 8-bore, I waited till the last minute to see what he really meant, and I certainly think he had made up his mind to try close quarters. Anyway my men thought so, as they all hastily clambered up trees; and as the hsaing, a fine herd-bull, suddenly turned round (he was running away), faced us, held his head well up, started shaking it and stamping the ground with one foot, I didn't wait any longer.

"The Burmans say that if one lies down flat, one is safe from a charging gaur, as he can't dig you with his horns and won't tread on you, but you are not safe in the same position from a hsaing. The horns of a hsaing bull come out at right angles to his face, whereas those of a gaur are in the same line as his face, more or less.

"Hsaing, as regards the number in a herd, vary considerably. I have met two females and one calf all alone, as well as solitary bulls, but the usual thing is to find a herd of, say, seven to twelve cows, a few calves,

with one bull. The smallest herd I have seen consisted of a bull, two cows and one calf; while the biggest herd seen consisted of about twenty cows, numerous calves and one magnificent bull, but there may have been more. I, however, never got a shot, as the animals all saw me before I saw them; they dashed off, and, as it was evening, there was no hope of coming up with them before dark. The track is more heart-shaped and pointed than that of the gaur, and also differs in size."

As already mentioned, banting occur in the Manipur district, especially in the Kubbu valley between Manipur and Northern Burma; and there is a considerable degree of probability that these banting are sub-specifically distinct from the Burmese animal. But, unfortunately, there are no specimens at present in our Museums; and it is not a commendable practice to give names to animals of which examples are not available for future reference and comparison.

For what we know of the Manipur banting, we are indebted to the observations of Surgeon-Captain H. S. Wood, who says that the bulls stand about 5 feet at the shoulder, and are red at all ages, while they show no white patch on the buttocks, although this conspicuous mark is fully developed in the cows. The bulls have comparatively small ears; and their general colour is dark red, passing into greyish white on the face, the under surface of the body, and the inside of the legs. They have no dark streak running down the back; the front of the fore-legs above the knee is reddish black; the tip and front margin of the ears is deep velvety black; the eye is encircled with a greyish-white ring, while the front and sides of the upper part of the head are tawny white, the naked muzzle being greyish black. In the cows the ears are larger, and the general colour of the upper-parts light red, with a dark streak running down the middle of the back, but no black on the ears or the front of the fore-legs. The under surface of the body, the legs from the knees and hocks to the hoofs, and the rump-patch are

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pure white. A cow measured by Captain Wood stood 4 feet 10 inches at the withers.

If the alleged absence of the white rump-patch be a constant feature in the bulls, and the presence of a dark dorsal streak an equally distinctive feature of the cows, there would seem little doubt as to the racial distinctness of the Manipur representative of the banting. Skins of both sexes of the Burmese and the Manipuri banting are, however, urgently needed; and until these are available the distinctive features and the range of colour-variation in either cannot possibly be properly determined.

THE YAK

(*Bos grunniens*)

NATIVE NAMES.—*Dong*, *Brong-dong* (wild race), *Pegu* (domesticated breed),
TIBETAN; *Yak*, LADAKI AND IN NORTH KUMAON; *Ban-choar*,
HINDUSTANI; *Kuch-gau*, PUNJABI; *Boku* (old bull) and *Kotass*,
KIRGHIZ

(PLATE II. FIGS. 4, 4a)

By the older naturalists the yak, or wild ox of Tibet, was almost invariably spoken of as the grunting ox; and so far as the domesticated breeds (from which the original description was taken) are concerned, the attribute in question is very distinctive of the animal. According, however, to the accounts of modern naturalists and travellers, the “grunting” practice is strictly confined to the domesticated breeds, the wild yak uttering no such sound. It has, therefore, been proposed to regard the latter as a distinct species, under the name of *mutus*; but this seems a quite unnecessary refinement in nomenclature, and the most that would be justifiable in this direction would be to designate the

wild race as *Bos grunniens mutus*. It is true that such a combination of names would involve a contradiction; but such little inconsistencies are not regarded as matters of any importance by modern naturalists.

By sportsmen the Tibetan wild ox is almost invariably spoken of by one or other of its native names; and so far, so good. But if they were determined, as they are, to use the name bison for any of the wild



FIG. 7.—Parti-coloured and White Domesticated Yak in the Park at Woburn Abbey.
From a photograph by the Duchess of Bedford.

cattle of India and the neighbouring countries, it should have been to the yak instead of to the gaur that this term should have been applied. For, as a matter of fact, the yak appears to be very closely allied indeed to the bisons, of which group it is best regarded as an aberrant member specially modified by its long isolation and the high elevation at which it lives.

How great is the elevation above the sea-level at which this animal ordinarily dwells in the wild state is probably but very imperfectly

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realised by the great majority of persons ; and it may perhaps assist the imagination to state that if the Tibetan plateau were at the summit of a cliff rising sheer up from the sea-shore, a yak looking over the edge of the cliff would be about four miles above the level of the sea !

Apart from certain features in the skull and the setting-on of the horns, to say nothing of the form of the latter, the yak approximates to the bisons in the long hair with which portions of its body are clothed, and also in possessing fourteen pairs of ribs, instead of the thirteen found in the gaur and its allies ; the bisons having fifteen pairs. The long hair is, however, still more elongated than in the bisons, and also differently disposed on the body ; while the enormous mass of bushy hair clothing the lower half of the tail at once serves to differentiate the yak from all its kindred.

In general build the wild bull yak is a massive, not to say a clumsy-looking animal ; attaining to a height of at least $5\frac{1}{2}$ feet at the withers, and, according to the reports of some sportsmen, falling but little, if at all, below 6 feet in exceptionally fine examples. The head is generally carried low, thus tending to accentuate the elevation of the withers, which form a more or less conspicuous hump, behind which the back is fairly level, without any decided falling away at the rump. The muzzle and ears are comparatively small, there is no dewlap, and the short and stout limbs terminate in large and massive hoofs. Very characteristic of the bull yak are its long, massive, and gracefully-curved black horns, which form some of the finest trophies of which the Indian sportsman can boast. Although very slightly compressed at the base in aged bulls, yak horns are nearly cylindrical in section and smooth throughout their length ; their curvature is at first upwards and outwards, then forwards, and finally inwards and upwards, with a slightly backward inclination in some examples. Cow horns (Plate II. Fig. 4a) are much more slender than those of the bulls. The longest yak horns on record

are a pair in the Museum at Lucknow, which are stated to measure 39 inches along the curve ; their other dimensions being unknown. Next to these are a pair measuring $38\frac{3}{4}$ inches in length, 17 in girth, and 19 between the tips. The lengths of other fine examples are respectively $35\frac{1}{2}$, 34, $32\frac{3}{4}$, 32, $31\frac{7}{8}$, 31, and $30\frac{3}{4}$ inches.

To return to the general description of the animal, the hair on the



FIG. 8.—Skull and Horns of Bull Yak. From a specimen in the British Museum.

head, back, and upper portion of the sides is comparatively short and smooth, but on the lower part of the flanks is elongated to form a pendent fringe extending across the shoulders and thighs ; there is likewise a tuft of elongated hair on the front of the chest, and the lower half of the tail is enveloped in a huge bunch of still longer hair, reaching somewhat below the hocks. In wild yak the coat is uniformly blackish brown throughout, although showing a little white in the region of the muzzle,

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with a sprinkling of grey on the head and face in old animals, and tending to rusty on the back in aged bulls. The semi-domesticated yak of the elevated plateau of Rupshu, which, as the present writer can testify from personal experience, are “kittle cattle” to deal with, are very large, and generally, if not always, as dark-coloured as their wild kindred. But in most parts of Ladak and the Tibetan districts of the Himalaya the domesticated breed is much smaller, and may be of any colour from black to white. In such breeds, too, which may have a strain of the Indian humped cattle in their blood, the cows (as shown in the photograph of the herd at Woburn Abbey) may be devoid of horns. It is from the tails of such parti-coloured or white yak that the white fly-whisks, or *chaories*, so much in vogue in the plains of India, are made. Pure-bred domesticated yak have two great disabilities—they will neither eat corn nor cross a bridge.

Wild yak are restricted to the plateau of Tibet, ranging from the eastern part of Ladak as far as Kansu, in North-West China, and extending northwards as far as the chain of the Kuen-Lun. In summer they are found at elevations between about 14,000 and 20,000 feet, and even in winter it is probable that, in Ladak at least, they seldom, if ever, descend much below 13,000 feet. So far as the writer is aware, wild yak have never been brought into Leh (11,500 feet), and it is most probable that they could not exist at levels much below this. The parti-coloured domesticated breeds, as well as the small black yak frequently brought into Darjiling, will, however, thrive, under suitable conditions, at the sea-level.

In Ladak the great district for yak is the Chang-chenmo valley, and the dreary regions between this and the Upper Indus; but these animals are yearly becoming scarcer within the territories under the rule of the Maharaja of Kashmir, although reported to be numerous in Tibet proper. One of the earliest British sportsmen in the Chang-chenmo district was General A. A. Kinloch, who has given an excellent account of the habits of wild yak. The second largest head in Mr. Rowland Ward's list

belonged to an animal shot in the Kuen-Lun range by the late Mr. A. Dalgleish, who during the seventies was in the employ of the Central Asian Trading Company. More recently yak have been shot by Mr. St. George Littledale in Tibet, and by Messrs. H. Z. Darrah and P. H. G. Powell-Cotton; the mounted specimen now exhibited in the British Museum being one of several that fell to the rifle of the gentleman last named. An interesting account of yak-shooting, by Mr. Edgar Phelps, will be found in vol. xiii. of the *Journal of the Bombay Natural History Society* (1900).

Yak feed chiefly upon the tufts of wiry grass dotted over the arid soil of the Tibetan plateau, and grow fat upon such apparently insufficient fodder. In search of food, or merely from a roving disposition, they are in the habit of traversing long distances, and feed mostly during the early morning and evening, reposing in the daytime on some bleak hill-side, where they can receive timely warning of the approach of danger. As in the case of other cattle, the old bulls are either solitary or associate in small parties of three or four; while the herds, which in undisturbed districts may include from about half-a-score to a hundred head, are formed by the cows, young bulls, and calves. In lieu of water, which is essential to their existence, yak will eat snow during the winter, or at very high altitudes at all seasons. Smell seems to be their most acute sense, hearing and sight being apparently less keenly developed.

For yak-shooting Mr. Darrah used the Lee-Metford rifle. He gives the following account of a stalk:—"Lying flat down, and pushing the Lee-Metford in front of me, I got behind a stone on the summit, and saw a large number of yaks in front of me, most of them some 250 to 350 yards off. It was easy enough to make out the principal bull of the herd, he was so much larger than the rest, but I could not distinguish any others of a decent size, though I saw two or three small ones. I lay where I was for some ten minutes, trying to make out which to fire at after the

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first shot at the big bull, but could not come to any satisfactory conclusion. The animals were entirely unconscious of danger ; some were lying down chewing the cud, and some feeding quietly about. The big bull was sometimes grazing, sometimes looking about him, but all the time moving more or less to the west, that is, to my right and up the nala. I did not like risking a shot at the distance he was off, and examined the ground to my right to see if there was any chance of getting nearer."



FIG. 9.—Black Domesticated Yak at Woburn Abbey. From a photograph by the Duchess of Bedford.

An opportunity for gaining a more favourable situation presenting itself, the big bull was crippled at the first shot, and soon afterwards dispatched. From the fact of his being with the herd it would seem that this stalk, which took place in August, was during the pairing-season. Mr. Darrah gives the length of the horns of this bull as just over 29 inches, with a girth of 13 inches ; but in Mr. Ward's list the length is entered as 30 inches.

1.



5.



1a.



4a.



5a.



4.



3.



2.



2a.



PLATE II

1, 1*a*. Gaur.

2, 2*a*. Gayal.

3. Burmese Banting, or Tsaing.

4, 4*a*. Yak.

5, 5*a*. Indian Buffalo.



THE ARNA, OR INDIAN BUFFALO

(Bos bubalis)

NATIVE NAMES.—*Arna* (bull), *Arni* (cow), OR, MORE COMMONLY, *Arna bhainsa* AND *Jangli bhains* (*bhains* being the name of the domesticated buffalo), HINDUSTANI; *Mang* IN BHAGALPUR; *Mains*, BENGALI; *Bir-biar* OF THE HO-KOLS; *Gera erumi* OF THE GONDS; *Mi Harak*, CINGALESE; *Moh*, ASSAMESE; *Siloi* OF THE KUKIS; *Gubui*, *Rili*, *Ziz*, AND *Le* OF THE NAGAS; *Misip*, KACHARI; *Iroi*, MANIPURI; *Kyrcvai*, BURMESE; *Pana* OF THE KARENS; *Karbo* OR *Karabu*, MALAY

(PLATE II. FIGS. 5, 5a)

Those who have seen the domesticated buffalo of Italy, Egypt, and India are acquainted with a degenerate descendant of the magnificent Indian wild buffalo, whose spread of horn exceeds that of any existing member of the *Bovidae*. The wild animal itself is, however, known to few besides sportsmen; since only two examples of the Indian buffalo have been exhibited in the London Zoological Gardens, one of which was lent in 1870, while the second (a cow) was presented by the Maharaja of Bhaonagar in 1893. Whether the former was a truly wild animal, the writer has no means of knowing. A fine bull, fit for mounting, is one of the desiderata of the British Museum. Fortunately, however, the national collection contains the finest pair of horns on record; the length along the outer curve of one horn being $77\frac{3}{8}$ and the basal girth $17\frac{7}{8}$ inches. All buffaloes differ from the other members of the genus *Bos* by the distinctly triangular section of their horns, as well as by the rounded form of the hinder part of the skull, and likewise by the sparsely haired skin, which may indeed be well-nigh naked in very aged individuals. By

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the present writer such points of distinction are regarded as of subgeneric value only, so that the full name of the Indian species would be *Bos* (*Bubalus*) *bubalis*; but to some it appears preferable to regard *Bubalus* (as also *Bison*) in the light of a genus by itself.

From its very distant cousin the African buffalo, the Indian, or, as it might perhaps be better termed, the Asiatic buffalo is at once distinguished by the form of the horns and the wide space by which these are separated at their bases from one another on the forehead in both sexes, as well as by the much greater length of the head, and the narrower and less densely haired ears. The profile of the head is nearly straight, and the convexity of the forehead moderate. The horns, of which male and female specimens are shown in the plate, are entirely black in colour, and curve almost in the same plane; those of bulls being much more massive than those of cows. As regards curvature, two distinct and well-marked types are recognisable. In the one, the horns curve regularly upwards from each side of the head in a semicircular manner, so as to be separated by a comparatively small interval at the tips (Plate II. Fig. 5). In the other type (of which the pair represented in Fig. 5*a* of the plate are a medium, not an extreme example), they spread almost directly outwards for the greater portion of their length, after which they curve somewhat upwards and inwards, the interval between their tips being consequently much greater than in the first type. It is commonly asserted that horns of the first type are those of bulls, while those of the second type pertain to cows. This is, however, disproved by a photograph of a series of horns of both sexes shot by H.H. the Maharaja of Kuch Behar, and herewith reproduced. In this series all the horns are of the first, or circular type; those of the cows being readily distinguishable from those of bulls by their inferior girth. Again, the enormous pair of detached horns in the British Museum, one of which measures $77\frac{3}{8}$ inches in length, although of the straight type, are so massive as to be almost certainly referable to a male.

And the same is the case with a slightly smaller pair of the same type, from Assam, also preserved in the Museum. The long slender straight horns frequently obtained from Assam are evidently the female of this type. From the evidence of the Maharaja's specimens, it would appear that in Kuch Behar all the buffaloes have horns of the circular type. And since horns of the straight type are known to occur in some parts of Assam, it would seem highly probable that there may be two local races of the species, distinguished by the form of the horns.

In Mr. Rowland Ward's list the longest horns of which the sex is definitely known are those of a cow, measuring $70\frac{1}{2}$ inches; 63 inches being the longest record for a bull. Among the specimens in the same list of over 54 inches, the minimum tip-to-tip is 22, and the maximum 101 inches; the specimen with the former measurement belonging to a bull, while the second, which is in the possession of Mr. Walter Rothschild, probably pertains to a cow.

As already mentioned, the ears of the Indian buffalo are relatively small and of a somewhat tubular form, with only a small amount of long hairs on their margins, although with a variable quantity in the interior. The tail, which terminates in a small tuft, reaches down about to the level of the hocks. Although aged animals are well-nigh nude, younger individuals have a certain amount of coarse, bristly hair all over the head and body; and it is noteworthy that, unlike the African buffalo, this hair is directed forwards from the haunches to the back of the head; a whorl on the hind-quarters marking the point at which the hair of this region commences to be directed backwards. In the typical race (now alone under consideration) the colour of the skin and hair is ashy or blackish grey, although there may be a more or less pronounced tendency to the development of dirty white on the lower part of the legs; this being especially noticeable in the domesticated breed. In height it is probable that the very largest adult bulls do not fall much, if at all, short of $6\frac{1}{2}$ feet at the withers;

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although at present the maximum measurement on record appears to be 6 feet $2\frac{1}{2}$ inches ($18\frac{1}{2}$ hands).

The dense grass-jungles covering the alluvial flats of the Ganges and Bramaputra, from Eastern Assam to Tirhut, form some of the most favoured haunts of the wild Indian buffalo. But the animal is also to be met with in many other parts of the peninsula, as, for instance, on the maritime plains of Orissa and Midnapur, as well as on the grass-lands of the eastern portions of the Central Provinces, especially in Mandla, Raipur, Sambulpur, and Bastar, whence it extends at least as far south as the Godaveri and Pranhita valleys. Wild buffaloes are also to be found in the northern districts of Ceylon; as they likewise are in Burma and the Malay countries. Whether, however, these Burmese and Malay buffaloes are aboriginally wild is a matter by no means easy to determine.

The arna (to use a term properly restricted to the male as applicable to both sexes) is very similar in its mode of life to the Indian rhinoceros, being essentially a grazing animal, inhabiting by preference tall grass-jungles, or reed-brakes, in which it is completely concealed, avoiding hills and rocks, and always seeking the neighbourhood of marshy swamps, in the warm mud of which it delights to wallow. Buffaloes are indeed the most water-loving of all cattle, frequently immersing the whole body, and leaving only the head exposed, instead of standing midleg-deep after the fashion of European cattle. Never (save for its magnificent horns) a handsome creature, the Indian buffalo looks positively hideous when a thick coat of brown mud has dried on its hide after a bath in a *jhil*, or swamp. Associating in large herds, buffalo feed during the early morning and again at evening, while they pass the greater portion of the day in repose, either quietly chewing the cud or sleeping. When disturbed during his mid-day siesta, an old bull is much more likely to prove an awkward customer than

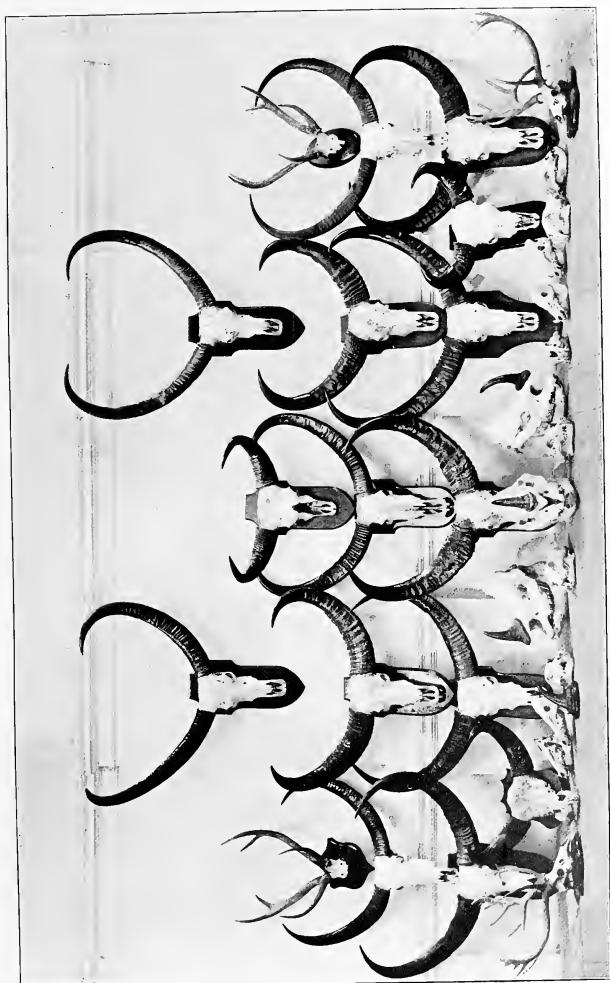


FIG. 10.—A series of skulls and horns of Indian Buffalo, male and female (together with other trophies).
Shot by H.H. the Maharaja of Kuch Behar.

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is one stalked during its feeding hours. In place of their usual haunts, buffalo may occasionally be encountered amid low scrub-jungle, but are seldom if ever seen in tree-forest. The pairing-season is in the autumn, and the calves (of which there are not unfrequently two at a birth) are born in the summer, the period of gestation being ten months.

Buffalo may be hunted either by beating with a line of elephants, by tracking on a single elephant, or by walking them up on foot; the hot season, in April and June, being the best for the latter description of sport, as the long grass is then dried and broken, or burnt down; while, as water is scarce, the animals are obliged to resort to such pools as remain, where their fresh tracks should be carefully looked for by the sportsman. A foot-print measures about 7 inches in length. Buffalo have been known to charge even before being wounded; and when they do charge, wounded or unwounded, they generally press the attack home. The way in which a buffalo charges an elephant is well described in Ball's *Jungle Life in India*. "Having fired or dropped all my 'express' cartridges," writes the narrator, "I fell back upon my old muzzle-loading 12-bore rifle, and then advanced; whereupon the calf ran out, being soon followed by the cow, in full charge at the elephant. Anarkalli (the elephant), not liking the aspect of things, trumpeted and turned tail, and put on a pace which fairly astonished me. All this time I had no little difficulty in keeping myself and four guns on the pad. However, as the buffalo came on I fired the heavy rifle at her with one hand, while I held on with the other. The bullet hit on the horn just as she was making a vigorous butt at Anarkalli's stern quarters. She then returned to her lair, and quite disappeared from sight by lying down. With some difficulty the mahout got the elephant back again; but as she was very nervous, I got off the pad into the branches of a tree. Presently the cow stood up, and I then gave her a shot behind the ear which immediately dropped her dead. In all she had received seven bullets, one of the 'express' balls having, strange to say, broken one of her

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hind-legs high up near its insertion with the pelvis. In spite of this she had run a long distance, and made the gallant charge I have described."

THE UPPER ASSAM BUFFALO

(*Bos bubalis fulvus*)

The head of a wild buffalo from Upper Assam which was mounted in the Indian Museum during the present writer's residence in Calcutta differs from the ordinary form by the uniformly dun-coloured hair;¹ the skull being also distinguished by the relative shortness of the face. On account of these differences the wild buffalo of Upper Assam seems well entitled to rank as a distinct race of the species; but additional specimens would be most acceptable to naturalists.

MARCO POLO'S SHEEP

(*Ovis poli*)

NATIVE NAMES.—*Kuchkar* (male), *Mesh* (female), WAKHAN; *Kulja* or *Gulja* (male), *Arkar* (female), TURKI OF EASTERN OR CHINESE TURKESTAN

(PLATE III. FIGS. 1, 1a)

Although exceeded in massiveness by those of the argali, the horns of Marco Polo's sheep are longer than those of any other species of the genus *Ovis*, and thus perhaps form the most magnificent trophies yielded by the wild sheep. Since every sportsman knows the distinctive features of sheep, it will on this occasion be unnecessary to consider them in any detail. Apart from their horns, sheep differ markedly from the oxen in the form

¹ In *Wild Oxen, etc. of all Lands*, p. 126, the word "dun" is unfortunately misprinted "dull."

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and structure of the muzzle, which is narrow and pointed, with the skin covered with fine velvety hairs, save for a small naked area immediately above the nostrils, and a narrow groove or cleft extending downwards from the same to divide the upper lip. In place of the two pairs found in the ox tribe, the ewes possess but a single pair of teats ; and glands are developed on the face below the eyes in most, as well as others between the hoofs in all, species ; both such glands being wanting in the oxen. In all the Asiatic members of the group the tail is quite short ; and in none of the species is there a dewlap or a beard on the chin ; while in none do the males exhale a strong, unpleasant odour. All the species inhabiting India and Central Asia have horns in both sexes ; but whereas those of the rams are large and spreading, in the ewes these appendages are small, slender, and more upright. The horns of the rams, at first starting, are directed obliquely outwards from the sides of the head, and then usually form a circular or spiral curve, with the upper border at first convex, and the tips pointing outwards. In section the horns are generally more or less triangular, while the surface is usually marked by fine parallel transverse wrinkles, separated by grooves ; and at intervals there occur lines of division marking the annual growths. Except in the bharal, the colour of the horns in the Eastern Asiatic species is some shade of yellowish olive or brown. In all wild species the hair is short, dense, stiff, and upright, quite unlike the wool of the European domesticated breeds, and is frequently elongated into a ruff on the throat. An important point of distinction from the oxen is to be found in the characters of the upper cheek-teeth, which have tall and narrow (instead of broad) crowns.

Coming to the special character of Marco Polo's sheep, we find that this animal is probably slightly inferior in height to the argali (described next), and of perhaps somewhat slighter build, while the horns of the rams are thinner and frequently longer. In the fully adult ram these are long and slender, forming more than one complete circle ; typically the front

angles of the horn are prominently developed, and the wrinkles on the front surface are placed relatively far apart, while those on the lateral surfaces are often but very indistinctly shown. In the summer coat, which appears to be rather longer than in the argali, the general colour of the upper-parts of old rams is light speckled brown ; the greater portion or the whole of the face, as well as the throat, the chest, the under-parts, the buttocks, and the legs are white ; the white also extending on to the outer surface of



FIG. 11.—Head of Ram of Marco Polo's Sheep, with horns measuring 59 inches along the curve.
In the possession of Mr. David T. Hanbury.

the thighs. A black streak runs from the nape of the neck to the withers. No distinct ruff of long hairs is developed on the throat in the summer coat ; but in winter, when the whole coat is considerably longer, such a ruff—pure white in colour—makes its appearance on the throat and chest. At this season, too, the fur on the back shows a more decided rufescent tinge, especially towards the boundary dividing the dark from the light areas. In the ewes during winter the neck is brown in front, and there may be a dark line extending from the head to the root of the tail, this

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streak being absent in summer. The horns of ewes (Plate III. Fig. 1*a*) appear to be more upright, deeper, and more sharply keeled in front than in the argali; but there may be a considerable amount of individual variation in this respect.

A mounted male specimen of *Ovis poli* in the British Museum stands 3 feet 5 inches at the shoulder; and the weight of an adult ram is estimated at 22 stone. The four finest specimens of the horns on record respectively measure 75, 73, 71, and 70 inches along the front outer angle; their respective basal girths being 16, 15, 15½, and 17 inches, and the tip-to-tip intervals 54½, 48, 53¾, and 52 inches.

This magnificent wild sheep has an extensive range in Central Asia, the details of which are given in the present writer's work entitled *Wild Oxen, Sheep, and Goats of All Lands*. It only enters the area treated of in the present volume in the plateau north of Hunza, a district on the southern flanks of the Karakorum or Mastag range, situated to the north-west of Gilgit. It is commonly found at elevations between 10,000 and 18,000 feet above the sea-level.

If the sportsman be not inconvenienced by living at such a height, he will find *Ovis poli* stalking much less fatiguing work than is the pursuit of markhor and ibex in the middle Himalaya; the reason being that the great sheep dwells on the top of the Central Asian plateau, where the country has not been cut up by the action of rivers and glaciers into the deep gorges and precipitous cliffs characteristic of the middle ranges of the Himalaya. The ground may, in fact, be described as partaking more of the nature of a rolling plain than of precipitous mountains, and difficult places are but seldom encountered. Nevertheless, although the sheep themselves are not excessively wary, stalking is by no means an altogether easy matter, owing to the open nature of the country, so that it is seldom that the sportsman can get to closer quarters with his quarry than a distance of between two and three hundred

yards. Moreover, it must not be supposed that *Ovis poli* invariably restricts itself to open, rolling country, any more than does its cousin *Ovis ammon hodgsoni*; both animals crossing rugged hills in their wanderings from one feeding ground to another, or in retiring to places of safety. An example of the precipitous country to which *O. poli* will sometimes betake itself is afforded by the photograph of a living specimen in Mr. R. P. Cobbold's *Innermost Asia*, where the animal is shown standing on the face of a cliff which would try the climbing powers of an ibex.

The general habits of this magnificent species appear to be similar to those of other wild sheep, the large flocks in which it collects being composed of ewes of all ages and young males, and the old rams going about by themselves in small parties of from two or three to eight or ten, and occasionally more. In summer the parties of old males keep to the highest accessible ground; but in winter, when many perish from starvation, they seek lower levels. It is not, however, from shortness of food alone that their numbers are diminished, for in the winter of 1897-98 rinderpest raged among the flocks on the Pamirs to such an extent that in certain districts almost a clean sweep was made of them.

The enormous weight of their horns causes the old rams when galloping to keep their heads nearly erect, instead of stretched out; and from the length of these appendages old rams cannot touch the ground with any part of the head except the muzzle.

When running at top speed at high elevations, they frequently show signs of shortness of wind by opening their mouths; up hill they never go at a great pace, and are then always compelled to halt from time to time to get their breath. As a rule they try to avoid snow-fields, and always display great care in steering clear of drifts and snow-filled gullies. They graze during the early morning, after which they spend most of the day in repose, feeding again about three or four in the afternoon. This, however, is in summer, and in the brief winter

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day their mid-day hours of repose are probably shortened. On the way to and from the grazing-grounds the old rams frequently butt at one another after the manner of their domesticated relatives; and on such occasions the sound of their horns clashing together is audible at a great distance. A low kind of grunt is uttered during these playful combats. When danger threatens, these sheep stare at the intruder and stamp with their fore-feet before taking to flight, in precisely the same manner as the domesticated breeds.

For *Ovis poli* shooting Mr. R. P. Cobbold, who was very successful in this sport, tells us in *Innermost Asia* that, according to his own experience, there is no rifle equal to the '256 Männlicher, whose supremacy over other small weapons has been so generally admitted.

Littledale's sheep (*Ovis sairensis*), which is a darker and smaller animal, with a white rump-patch in winter but none in summer, and horns somewhat intermediate between those of *poli* and *ammon*, is found much north (the Saiar Mountains) of the area treated of in this volume.

THE TIBETAN ARGALI

(*Ovis ammon hodgsoni*)

NATIVE NAMES.—*Nyan* (male), *Nyammo* (female), LADAKI ;

Nyang, *Nyand*, AND *Hyan*, TIBETAN

(PLATE III. FIGS. 2, 2a)

Although frequently regarded as representing a species by itself, the nyan of Ladak comes so close to the typical *Ovis ammon* of the Altai, that it may well be classed merely as a local race of the latter. The males of this fine species (that is to say, of the argali in its widest sense) appear to be the largest of all wild sheep, and are



4.



5.



4a



1a.



5a.



2a.



1



3.



2.



PLATE III

1, 1*a*. Marco Polo's Sheep.
2, 2*a*. Tibetan Argali.

3. Sha.
4, 4*a*. Urial.

5, 5*a*. Bharal.

characterised by the massiveness of their horns, in which the basal girth is very large, and both the front and lateral surfaces are very broad. Very generally both the inner and outer front angles of the horns are rounded off in the basal portion of their length, and the transverse wrinkles are numerous and closely approximated, with the intervening grooves deep, and strongly developed on both the front and the lateral surfaces. As regards their curvature, the horns form a spiral varying from somewhat less to considerably more than a complete circle. In the ewes (Plate III. Fig. 2a) the horns are much smaller and more erect, with a backwards and outwards curvature, and becoming thin and strap-like towards the extremities. In winter the hair is comparatively long, close, and coarse; but in summer, and more especially in aged rams, it is exceedingly short and thin, almost recalling that of a closely-clipped horse. There may be an abundant ruff of long white hair on the throat. On the upper-parts the general colour in the rams varies from wood-brown in winter to a kind of speckled whitey brown in summer, at least in aged individuals. There is a more or less distinct white disk on the buttocks (most developed in winter); the face and front of the legs vary from whitey brown to brown, according to season and race;¹ the inner side of the limbs and most of the under-parts are whitish; but the thighs are always dark like the back. Ewes, which are scarce in collections, probably show less white on the face, legs, and rump, and may have a tuft of longish hair on the nape of the neck.

As regards the distinction between *O. poli* and *O. ammon*, the following passage may be quoted from *Wild Oxen, etc. of All Lands*. The general characters of the horns of adult rams of the typical *O. ammon* are so different from those of the adult male *O. poli* that there is never any

¹ In *Wild Oxen, etc.*, it is stated that the face and front of the legs are always white, whereas they are whitey brown only in old males of the typical race during summer.

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difficulty in distinguishing between the two animals, which are further differentiated by colour, the former having the outer surface of the thighs coloured like the back, while in the latter it is white. In the Tibetan race, where the horns are often more angulated, they are always much more massive than those of *poli*, as well as considerably shorter.

In the Tibetan or Hodgson's argali the height at the shoulder seems to range from about $3\frac{1}{2}$ feet to at least 3 feet 10 inches. The horns of the rams are less massive than in the typical race, and form a less open spiral, which does not exceed, and often falls short of, a complete circle. In nearly all instances their tips are broken, the wrinkles are but moderately prominent, and the outer front angle is, even in adult examples, frequently distinct. Adult males have a ruff of long whitish hair on the sides of the neck and the throat, which is believed to be present at all seasons; and there is a crest of dark hair running from the nape of the neck to the withers. In the ewes, according to General A. Kinloch, a shorter ruff of dark hair is developed on the throat.

Apart from the throat-ruff, the general colour of the hair is very similar to that of the typical race, but the old rams seem to be always darker. Greyish brown is the general colour of the upper-parts, the throat, chest, under-parts, and inner side of the limbs being white or whitish. The whole of the upper part of the face is brown, at least in the winter dress, but the lower part is generally somewhat lighter. There is also a dark streak down the front of the legs below the knees and hocks in the winter dress; but whether in summer these parts become lighter is not ascertained. Indeed, specimens in the short summer coat are desiderata.

In a ram measured by Major Greenway the length from the nose to the tip of the tail was 76 inches, and the weight about 212 lbs.

In a ram shot by Mr. P. H. G. Powell-Cotton, whose age was estimated at ten years, the shoulder-height was 3 feet 9 inches, the girth 4 feet 2 inches, and the weight 205 lbs. The largest pair of horns on record, which were obtained by Mr. Arnold Pike in Ladak, measure 57 inches along the front curve, and have a girth of $18\frac{3}{4}$ inches, and a tip-to-tip interval of 29 inches. The four next largest specimens recorded by Mr. Rowland Ward respectively measure $50\frac{1}{2}$, 50, $48\frac{1}{2}$, and 48 inches in length; their basal girths being $18\frac{1}{4}$, 17, 19, and 16 inches.

The range of this sheep includes the plateau of Tibet, extending from Northern Ladak at least as far east as the districts north of Sikkim, and northwards to the Kuen-lun and perhaps beyond the Mustag range, while farther east it may embrace the southern confines of the Gobi Desert. The animal is unknown to the southward of the main Himalayan axis, and does not even extend into Zanskar. In Ladak, where Chang-chenmo is one of its favourite resorts, the argali is seldom found below 15,000 feet, although descending to 12,000 feet during winter.

Captain F. E. S. Adair, who has recently described his experiences of nyan stalking in Ladak,¹ and obtained a ram with horns of $42\frac{1}{2}$ inches in length, is of opinion that the '450 "express" does not carry a bullet of sufficient weight to afford satisfactory results in this description of sport; the vitality of the animal being so great that it can carry a fairly well-placed bullet for a much longer distance than its pursuer, in the rarified atmosphere of Tibet, is capable of following. This, however, scarcely accords with the experience of Mr. Cobbold referred to above; although it must be remembered that the latter gentleman used a Männlicher.

Although the large flocks of ewes and young rams which are met

¹ *A Summer in High Asia.*

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with in the Chang-chenmo district can be approached within a short distance, the case is very different with the crafty old rams, which, during the summer, keep apart from the flocks and resort to the highest grounds on which subsistence is procurable. Even when they are in broken country, the stalking is difficult enough, but when in the open, it requires all the skill of the sportsman to get within range. Younger rams may be seen with two or three ewes even in the summer. As the general habits of the nyan are practically the same as those of Marco Polo's sheep, it will suffice to say that the pairing-season occurs in the middle of the winter, and that the lambs are born five months later—in May or June.

THE SHA, OR ASTOR AND LADAK WILD SHEEP

(*Ovis vignei*)

NATIVE NAMES.—*Sha*, *Shapo* (male), *Shamo* (female), LADAKI ;

Urin, IN ASTOR

(PLATE III. FIG. 3)

The sha of Astor and Ladak and the urial or oorial of the Punjab Salt Range are local races of a species distinguishable at a glance from both of the preceding kinds of wild sheep by its greatly inferior size and lighter horns. And since there is no danger of the sportsman mistaking the present animal for either of the latter, its description may be of the briefest. Inclusive of the two races, *Ovis vignei* may be described as a medium-sized wild sheep, with comparatively slender and well-wrinkled horns of considerable length, which, when fully developed, curve forwards along the sides of the face, so that their tips come more or less nearly below the line of the

eyes. The curve may be almost entirely in one plane, or in a spiral, and seldom exceeds one circle. The degree of prominence of the two front angles of the horns is liable to a considerable amount of local or individual variation. The ewes have shorter and nearly straight horns. In the adult rams a ruff of long hair is developed on the throat, at first commencing as two lateral tufts, which soon unite in front. In summer the general colour of the upper-parts varies from rufous brown to grey, while in winter it is greyish brown; the tail, a disk on the buttocks, the inner surface and more or less of the lower portion of the legs, together with the under-parts, white or whitish; throat-ruff varying from black and white to pure white with black at the roots; muzzle and parts of side of face in old animals white or whitish; a patch behind the shoulder, and in some instances a line on the flanks, certain markings on the outer side of the limbs, and the tip of the tail blackish brown or black.

In the true sha or urin of Ladak and Astor (the Astor animal being the type of the species) the height reaches to as much as 36 inches at the withers; while the horns of old rams are massive at the base and form a wide circle, with more or less markedly divergent tips. Their front angles are rounded to a greater or less degree, so that they do not ever appear to form distinct beads or keels, and the transverse ridges on their front edge are never very coarse. The general tone of the summer coat tends rather to brown than to red; and the ruff on the throat seems to be always smaller and mainly blackish brown.

In the thirteen largest horns of this race recorded by Mr. Rowland Ward in the last edition of his book on horn-measurements the length along the front curve varies between 32 and 39 inches, while the basal girth ranges between $10\frac{1}{2}$ and $12\frac{1}{4}$ inches, although only three examples fall below 11 inches.

The head figured in Plate III. Fig. 3 is taken from a specimen in

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the British Museum shot in Ladak by Mr. P. H. G. Powell-Cotton. Although the horns are by no means large, the animal is fully adult, so that the characters of the ruff may apparently be taken as distinctive of the race. It will be seen that this ruff is restricted to the upper part of the throat, and is mainly formed of black or blackish-brown hairs, although in front these are partially overlain by white hairs. And it is these latter which become more developed to form the long white ruff distinctive of the Punjab race. Although the present writer has never seen horns of the true sha showing the distinct beads on the front angles of those of the Punjab race depicted in Fig. 4 of the Plate, yet in other respects sha horns may be practically indistinguishable from those of urial, although their average basal girth is greater.

The geographical range of this race of wild sheep extends from Astor, where the animal is known as *urin*, to Zaskar, Ladak, and other districts in Tibet, where it is known as the *sha*. Eastwards the habitat extends through Gilgit to the confines of Afghanistan, where there is probably an intergrading between the present and the next race of the species. In Ladak and Zaskar these sheep are found at high elevations, in comparatively open country, where the herbage is scanty and forests do not exist. In Astor and Gilgit, on the other hand, they inhabit lower levels, where there are extensive grassy tracts below the forest-belt. Their habits, allowing for the difference in the nature of the country, are probably very similar to those of the Punjab and Afghanistan urial, although the accounts given of these by sportsmen are by no means so full as is desirable.

THE URIAL, OR PUNJAB WILD SHEEP

(Ovis vignei cycloceros)

NATIVE NAMES.—*Guch* (male), *Mish* (female), PERSIAN; *Koh-i-dumba* (mountain sheep), PUSHTU; *Koch*, *Gad* (male), *Garand* (female), BALUCHI AND SINDI; *Kar* (male), *Gad* (female), BRAHUI; *Urial*, PUNJABI

(PLATE III. FIGS. 4, 4^a)

The urial, which is merely a rather small and brightly coloured local race of *Ovis vignei* of Tibet, is the only wild sheep inhabiting India proper; and since it is to be met with in localities comparatively close to civilisation, where stalking is by no means difficult, its pursuit does not entail the time and hardships inseparable from sheep-stalking in Tibet and other parts of Central Asia.

In height the rams seldom appear to exceed about 32 inches. The summer coat is a bright rufous brown, or foxy red; and the ruff on the throat and chest attains a great development, the long hairs on the front of its upper portion being pure white in old rams. Compared with those of the sha, the horns of the rams, which are usually slightly spiral, form a less open and more compact spiral, with their tips convergent and approximating to the eyes. Very frequently also their two front angles are prominent and form distinct nodose beads, or keels, between which the front surface is concave and marked by bold and widely separated transverse ridges, as in the old ram from Afghanistan forming the subject of Plate III. Fig. 4. In other specimens, however, as in a mounted male from Peshawur and two heads in the British Museum obtained by Dr. Aitchison in Afghanistan,

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the front angles are much less prominent, and the horns are much more like those of the sha. Such differences are not solely due to age; and in the case of some specimens it is, as already mentioned, very difficult to distinguish between sha and urial horns.

In the thirteen largest specimens of typical urial horns catalogued by Mr. Rowland Ward, the length along the front curve ranges between $32\frac{1}{2}$ and $39\frac{1}{2}$ inches, while the basal girth varies between $8\frac{1}{4}$ and 11 inches, six of the specimens measuring less than 10 inches. It is true that there is one specimen with a basal circumference of $11\frac{3}{4}$ inches (the length being $30\frac{3}{4}$ inches); but, speaking generally, it may be affirmed that urial horns are of inferior girth to those of the sha. Now the specimen on which *O. cycloceros* was founded agrees with the general sha type rather than with the urial type, so that there is considerable probability of *O. cycloceros* being really a synonym of *O. vignei*, instead of, as commonly supposed, indicating the Punjab form.¹ And if this be so, it is, strictly speaking, no longer permissible to call the latter *O. vignei cycloceros*. But the difficulty is to know what name to use in place of this title. Some years ago the urial of Kelat in northern Baluchistan was described by Mr. A. O. Hume as a distinct species, under the name of *O. blanfordi*, on account of the circumstance that in the type specimen the horns appeared to form a more open spiral, and consequently to be more widely separated at the tips than is the case in the Punjab animal. According to the amended measurements given by Mr. Rowland Ward, the length of the horns in the type specimen is 36 inches, their basal girth $9\frac{1}{4}$ inches, and the interval between their tips 17 inches. In the original description Mr. Hume contrasted this specimen with a Punjab skull in which the tip-to-tip interval was only $5\frac{1}{2}$ inches. Mr. Hume possesses, however, a second skull from the neighbourhood of

¹ This statement must be taken as superseding the one on p. 168 of *Wild Oxen, etc.*, Mr. Rowland Ward's lists having been improved since the publication of the latter.

Kelat in which the last-named interval is 11 inches, the length of the horns being $37\frac{1}{2}$ inches; and there are two others known from Baluchistan in which this interval is respectively 10 and $10\frac{3}{4}$ inches. Moreover, in the Punjab head figured below on the present page, the tip-to-tip interval is $18\frac{1}{4}$ inches, and in Mr. Rowland Ward's book there are several specimens recorded from the Punjab, Sind, and Afghanistan in which this interval exceeds 16 inches. Consequently there do not appear to be any sufficient grounds for the separation of the Kelat urial as a distinct local



FIG. 12.—Head of Male Urial. From the "record" specimen shot by Col. F. H. Taylor in the Punjab.

race; and the name *blanfordi* would thus seem to be available to replace *cycloceros*. But, unfortunately, the name *Ovis arkal* was applied, at a much earlier date than Mr. Hume's description of the Kelat animal, to a wild sheep from the Kopet-Dagh range, which forms the boundary between Turkestan and North Persia, to the eastward of the Caspian. And, as stated in *Wild Oxen, etc. of All Lands*, this *O. arkal* appears inseparable from *cycloceros*. If this view be correct, the name *arkal* has the right of priority for the Punjab wild sheep. In the absence, however, of skins

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for comparison, it is almost impossible to be sure that *O. arkal* may not indicate yet another local race of the present widely-spread species. Monsieur Dauvergne, in an interesting paper on Asiatic big game published in the *Bulletin* of the Paris Museum of Natural History for 1898, has indeed suggested (p. 217) that *O. arkal* may be the same as *O. blanfordi*, which he keeps apart from *O. cycloceros*. Under these difficult circumstances it seems best for the present to retain the latter title for the Punjab race of the urial.

The typical urial occurs in the Salt Range of the Punjab, whence it extends into the Cis-Indus ranges of the Western Punjab and Sind, and so on into Afghanistan, Baluchistan, Southern Persia, and apparently Russian Turkestan and parts of the Caucasus. The wild sheep of the two districts last mentioned is the aforesaid *Ovis arkal*, which may possibly indicate another race. It has been said that the Persian urial lacks the throat-ruff, but this is certainly not the case with a specimen from near Teheran figured in a work by the present writer entitled *Horns and Hoofs*.

Urial in the Punjab are met with in low hills or on undulating ground deeply intersected with narrow gullies and ravines, usually preferring the scarped hill-sides to bush or jungle. In the Jhelam district much of the ground they frequent consists of reddish coloured rocks, against which their foxy red coats are almost invisible except at very close quarters. Both sexes are commonly seen together, although during summer the old rams separate themselves to a certain extent from the flocks, which may vary in number from as few as three or four to as many as twenty or thirty. In the Punjab the pairing-season takes place in September, and the young, of which there may be either one or two at a birth, are produced about six months later. In many of their habits urial are very like ordinary domesticated sheep, their usual cry being a bleat, while when frightened they utter a shrill whistle and stamp vigorously on the ground with their fore-feet. When the sun shines

with its full power on the hill-sides and ravines where they dwell, the heat in summer becomes excessive, and the urial then seek shelter under shady rocks or among the jungle, feeding only in the comparative coolness of the mornings and evenings. In the cold season, especially when the sky is cloudy, and probably also during the rains, they may be seen on the move at all hours. They are better than the argali at getting over rough and rocky ground, although decidedly inferior in this respect to the bharal. In undisturbed districts they seldom wander far from their feeding-grounds, and often descend into the open fields near by to graze on the young wheat and other crops. On the other hand, when they are much shot at, they retire to a considerable distance from their grazing-grounds before reposing for the mid-day hours. The steep ridges and ravines among which they dwell afford excellent stalking-ground, if only the sportsman can manage to walk over the loose stones and shingle without alarming his game. And even when thus disturbed, the flock will frequently be found in the adjoining ravine.

THE BHARAL, OR BLUE SHEEP

(*Ovis nahuja*)

NATIVE NAMES.—*Bharal*, *Bharar*, AND *Bharut*, HINDUSTANI; *Na* OR *Sua*, LADAKI; *Wa* OR *War* IN THE SUTLEJ VALLEY; *Nervati*, NEPALI; *Nao* OR *Gnao* OF THE BHOTIAS

(PLATE III. FIGS. 5, 5a)

Whatever difficulty may be experienced in distinguishing between some of the other species and races of wild sheep (and in truth, owing to the close resemblance existing between several of them and the

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difference between their summer and winter coats, they are a very puzzling group) there is none at all in the case of the bharal or blue sheep of Tibet, which is markedly distinct from all the rest, and makes a step in the direction of the goats.

One of the most striking features of this species is to be found in the horns, which in the rams show a peculiar S-like curvature, and are rounded or sub-quadrangular at the base, with the whole surface (save for the annual rings of growth) nearly smooth and devoid of the transverse wrinkles and grooves so characteristic of these appendages in other Asiatic wild sheep. The horns of the ewes (Plate III. Fig. 5*a*) are also unlike those of other sheep, being short, closely approximated at their bases, much compressed, and curving upwards and outwards in a somewhat scimitar-like fashion. Then, too, there are no traces of the glands below the eyes found in all the species of the genus hitherto noticed. Neither is the coloration less distinctive; there being a distinct black stripe running along the flanks to divide the fawn of the back from the white of the belly, as well as similar stripes down the front of all four legs, and a dark streak down the face.

In this latter respect, as well as in the absence of face-glands, the bharal is indeed more like a goat than an ordinary wild sheep, and it may consequently be well asked why the creature is classed among the latter rather than among the former animals, especially as the tail is relatively longer than in the other Asiatic wild sheep. To this it may be replied that the bharal lacks the beard found in the males of all species of goats, as well as the unpleasant odour so strongly in evidence in the latter. Moreover, there are glands between the hoofs in all the feet, whereas in goats such glands are never present in the hind limbs. Still it has to be acknowledged that the distinction between sheep and goats is, after all, but very slight, and that the bharal forms one of the connecting links between the two groups.

In size the bharal stands about 36 inches at the withers ; its build is rather heavy, the head long and narrow, the ears short, and the coat, which is very thick and dense, without trace of either a mane on the neck or a ruff on the throat. The general colour of the hair on the back and the rest of the upper-parts is brownish grey with a tinge of slaty blue, tending more to brown in summer and more to slaty grey in winter. The under-parts of the body, the inner and hind surfaces of the legs, and the buttocks as far as the root of the tail are pure white. In full-grown rams the face and chest, a stripe running down the front of the legs (interrupted by a white patch at the knees), a band along the lower part of the flanks bordering the white below, as well as the terminal two-thirds of the tail, are black. These black markings are, however, wanting in the ewes. The colour of the horns is blackish olive. A full-grown bharal is stated to weigh about one hundred and thirty pounds.

The longest pair of bharal horns on record were formerly in the possession of the late Brian Hodgson, and were stated to measure 32 inches along the curve. The next largest are $31\frac{1}{2}$ inches in length, with a basal circumference of $13\frac{1}{2}$ inches, and a tip-to-tip interval of $22\frac{1}{2}$ inches. Three specimens are on record whose length is 30 inches or over but less than 31 ; while there are five known whose length reaches 29 inches but falls short of 30.

Bharal are met with in Tibet and the adjacent districts at high elevations, being seldom found in winter below 10,000 feet, and in summer ascending to between 14,000 and 16,000 feet, or even higher. Their range extends from the main axis of the Himalaya in the south to the Kuen-lun and Altyn-tag in the north. Eastwards they are known to extend as far as Moupin, in Eastern Tibet, while westwards they range to Shigar, in Baltistan, and to the neighbourhood of Gujhal, in the upper Hunza valley near Passu. The fact of their occurrence in the latter district has been recently recorded by Captain A. H. M'Mahon in a paper

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contributed to the *Journal of the Bombay Natural History Society* for 1899.

As bharal approximate to the goats in structure and coloration, so they show certain resemblances to the latter in the matter of habits. For, although displaying an ovine habit in dwelling on open undulating country and resting at mid-day on or near their feeding-ground, these animals are much more active mountaineers than other Asiatic wild sheep, ascending steep cliffs with comparative ease, and taking as rapidly as possible to difficult places when disturbed. The traveller in the more remote valleys in the neighbourhood of Leh may occasionally have the good fortune to stumble on a flock of bharal feeding or reposing on his line of route, as once happened to the present writer. On such occasions, with fair luck, several rams may be obtained without much difficulty, since, after being fired at, the members of the flock will run but a short distance before turning round to gaze at the intruder on their domains, after the manner of sheep in general, whether wild or tame. And a beautiful sight it is to see these handsome animals either lying down on the turf by the side of a mountain stream or standing at gaze. Many of the valleys in which they are found are strewn with boulders or masses of rock projecting through the turf, so that at a short distance it is frequently difficult to distinguish between boulders and bharal. The number of individuals in a flock commonly varies from ten or less to forty or fifty, but occasionally there may be as many as a hundred in company. In some districts on the Upper Indus the old rams are stated to betake themselves to feeding-grounds quite apart from the rest of the flock ; but in certain places, at any rate, both sexes may be seen together at least during a portion of the summer. It does not appear that bharal and sha are ever found together, but bharal and ibex have been observed on the same ground, and bharal and tahr seen actually grazing in company.

THE SIND WILD GOAT

(Capra hircus blythi)

NATIVE NAMES.—*Pasang* (male), *Bōz* (female), AND, COMMONLY, *Bōz-pasang*, PERSIAN; *Bor̄z*, PUSHTU; *Sair*, *Phashin*, *Pachin*, AND *Bor̄z-kuhi* (female), BALUCHI; *Chank* (male), *Hit*, AND *Haraf* (female), BRAHUI; *Ter* AND *Sarah*, SINDI

(PLATE IV. FIGS. 1, 1a)

As already mentioned, the goats (under which general term the naturalist includes ibex) are so closely connected by means of the bharal and other aberrant forms with the sheep that it is very hard to draw up a definition for either of the two groups. No goat has, however, glands either on the face or between the hoofs of the hind-feet, while the bucks are furnished with a more or less conspicuous beard on the chin, and likewise exhale the well-known "goaty" odour. Moreover, whereas wild sheep always have a short summer coat, in the majority of goats the coat is more or less long and shaggy at all seasons. In the typical genus *Capra* the horns of the full-grown males, which are of great relative length, arise close together on the forehead, and are more or less compressed or angulated, springing above the plane of the forehead either in a scimitar-like curve or in a spiral. In the does the horns are much shorter and placed further apart at their bases.

The Sind wild goat—the Sind ibex of sportsmen—is a near relative of the Persian wild goat (*Capra hircus ægagrus*), which is itself nothing more than the wild representative of the domesticated goat. The ordinary Persian wild goat is an animal of comparatively slender build, standing about 37 inches at the withers. In old males the long scimitar-shaped backwardly curving horns are compressed, with the front edge sharp and keeled for some distance above its base, after which it carries several bold

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and widely separated knobs. On their inner side the horns are nearly flat, externally they are convex, and posteriorly rounded off. Although occasionally directed outwards, their tips are usually inclined inwards; throughout their length they are marked by faint transverse striations, and in colour they are nearly black. In the does (Plate IV. Fig. 1a) the horns are less compressed, not longer than the head, and devoid of knobs. The



FIG. 13.—The Sind Wild Goat. From a buck killed in the Lora Haman Hills, north-west of Kelat, by Sir Robert Harvey.

beard of the bucks is very long, especially in winter, and in old animals occupies the whole width of the chin, although in their younger brethren restricted to its middle portion. During the winter the hair on the neck and shoulders becomes markedly longer than in summer; and in the colder portions of its habitat the animal develops a coat of woolly under-fur, or pashm, at the base of the hairs. In winter the general colour of the upper-parts may be described as some shade of brownish grey, and in summer as reddish brown; but at all seasons the very old bucks tend to

become paler. On the under surface of the body, as well as on the inner sides of the buttocks and thighs, the hair is white or whitish. Although some degree of individual variation is observable in the extent and form of the black and white markings, it may be said, speaking generally, that in the full-grown and sub-adult bucks the face, a broad streak from the nape of the neck to the root of the tail, the whole of the latter, a collar on the



FIG. 14.—Skull and Horns of Male Sind Wild Goat. From a specimen in the Collection of Mr. A. O. Hume.

neck expanding below into a breastplate, the throat, the chin, the beard, the front surfaces of the legs, with the exception of the knees, and a stripe along the flanks defining the brown of the back from the white of the under-parts and joining the dark streak on the front of the thighs, are dark blackish brown, passing in some examples almost into pure black on the beard, face, and certain other parts. The knees, the hinder and inner surfaces of the fore-legs immediately below, together with the hocks and the corresponding surfaces of the lower portion of the hind-legs, are white.

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Compared with the Persian animal, the Sind wild goat appears to be of slightly inferior size, with the horns of the bucks either entirely without knobs or carrying only a few very small-sized ones. The ground-colour of the coat is likewise decidedly paler. Sometimes the neck and the fore part of the body behind the dark collar are much lighter than the rest of the animal, the bucks often showing a large patch of dirty white on each side of the neck, and having the greater part of the body behind the shoulder-collar (which is dark mahogany brown) nearly pure white. Sir Robert Harvey describes them as very different-looking animals to the specimen figured in *Wild Oxen, etc. of All Lands*; but they would be more like a buck from Mount Ararat in the British Museum, which has light-coloured fore-quarters. Another feature is that, in proportion to their lengths, the horns are frequently rather more closely approximated at their tips than in the Persian wild goat. The three finest pairs of horns on record respectively measure $52\frac{3}{8}$, 48, and $46\frac{3}{4}$ inches in length, with basal girths of $7\frac{7}{8}$, 8, and $7\frac{5}{8}$ inches, and tip-to-tip intervals of $8\frac{3}{4}$, $20\frac{1}{2}$, and 14 inches. The second specimen is an exception to the general rule in respect to the interval between the horn-tips being comparatively small.

The Sind race of the wild goat is an inhabitant of the mountains of the country from which it takes its name, as well as those of Baluchistan. In the eastern districts of the last-named country it probably passes imperceptibly into the Persian race of *Capra hircus*. Whether the wild goat of Afghanistan is identical with the Persian or the Sind representative of the species remains for future determination.

In connection with the names of the Sind wild goat in its own country, it is interesting to note that one of its titles is *Ter*, which suggests affinity with the term *Tur*, applied to the wild goats of the Caucasus, and likewise with *Tahr*, the well-known appellation of the Himalayan representative of the short-horned goats.

In Sind, at any rate, the present race inhabits a more barren and less



PLATE IV

1, 1*a*. Sind Wild Goat.

2, 2*a*. Himalayan Ibex.

3. Astor Markhor.

4. Pir Panjal Markhor.

5, 5*a*. Suleman Markhor.

6. Himalayan Tahr.

7. Nilgiri Tahr.

wooded country than does its Persian representative, and it appears to be found at no very great elevation above the sea-level. Allowing for this difference, its habits are probably very similar.

THE BALTISTAN IBEX

(*Capra sibirica wardi*)

NATIVE NAMES OF ASIATIC IBEX GENERALLY.—*Skin* or *Sakin* (male), *Dabmo* or *Danmo* (female), LADAKI; *Kel*, KASHMIRI; *Tangrol* IN KULU; *Buz* IN KUNAWAR; *Skin*, BALTI

The Asiatic ibex, of which the race inhabiting the Thian Shan range and Siberia is the typical representative (*C. sibirica typica*), is one of the handsomest of all the wild goats, its long, sweeping, and boldly knotted horns being much thicker and more massive than those of the Arabian ibex, while they greatly exceed in length all known specimens of the horns of the typical, or Alpine ibex. Apart from the special characters of its several local races, the Asiatic ibex presents the following distinctive features. The height at the withers reaches to between 40 and 42 inches, the general build is heavy, with the legs coarse and clumsy; and the long and pointed beard occupies the middle of the chin. In the long and scimitar-shaped horns of the males the front surface is very broad, with no bevelling away of the outer edge, and bearing a number of prominent and thick knots or knobs, of which the outer side is almost as much developed as the inner. In section these horns form a complete triangle, with the hinder angle compressed. Female horns are very much smaller and much more widely separated at their bases, and are coarsely rugose or ringed, without knots; their transverse section being oval at the base but compressed above; they curve slightly backwards. The fur is coarse, dense, and somewhat brittle;

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along the back of the old bucks it is elongated to form a kind of crest, and in winter, at any rate, it is underlain by a thick coat of under-fur, or pashm, which may be visible at the surface during the season when the coat is being shed.

The colour of the Asiatic ibex varies so much according to sex, age, and locality, that it is a somewhat difficult matter to give a description which shall be applicable to all the local varieties of the species. And the difficulty is increased by the lack of a sufficiency of skins from different localities for comparison. Speaking generally, it may be said that in summer the prevailing colour of the upper-parts is some shade of brown, varying from whitey brown to chocolate (in old males), and in some instances with a large buffish-white saddle on the hinder part of the back, and a smaller patch of the same colour on the withers. The under-parts may be nearly the same colour as the back, or markedly lighter. In winter the coat is generally paler, being often yellowish or dirty white, but, especially in old males in the early part of the season, it may be chocolate, with the aforesaid light-saddle. At all times of the year a chocolate streak generally, if not invariably, runs down the middle of the back; and the beard and tail, together with the legs, are generally dark chocolate-brown, although the latter may be white on the hinder surface. The females, which are considerably smaller than the males, are generally more uniformly coloured, being greyish brown with dark legs; but in one race they are lighter-coloured, with the under-parts pure white. The winter coat appears to become lighter coloured as the season advances, owing to bleaching by exposure to the weather.

In the typical Siberian race of the Asiatic ibex, of which a specimen in the British Museum, from the Thian Shan, is figured in Plate XXIV. of *Wild Oxen, Sheep, and Goats of All Lands*, the general colour is light brown, with most of the under-parts only a little lighter than the flanks,

the chocolate streak down the back being very well defined, and the abdomen and the hinder half of the lower portion of the legs white. There is no trace of a white saddle in either of two mounted specimens in the British Museum, one of which is from the Altai and the other



FIG. 15.—Male Baltistan Ibex. From the mounted type specimen in the British Museum.

from the Thian Shan. In winter the colour is probably paler than in summer, but it is not easy to ascertain whether the Museum specimens are in the winter or the summer coat.

It is not certain whether this typical race (*C. sibirica typica*) enters the area under consideration.

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The Baltistan ibex, of which a description by Mr. F. W. True will be found on p. 282 of the work last cited, is a very dark-coloured animal, with a very large buffish-white saddle (bisected by the chocolate dorsal streak) occupying the whole of the hinder part of the back, and another smaller patch of the same colour in front of the withers. Elsewhere the fur is dark brown, with the exception of the posterior surface of the hind legs, where it may be white, and the abdomen, where it is whitish.

Mr. True's description is taken from two skins, now in America, obtained from Braldu, in Upper Baltistan; and since that was written I have seen two beautiful specimens from the same part of Baltistan, mounted by Mr. Rowland Ward, one of which (Fig. 15) he has presented to the British Museum. The latter example differs from Mr. True's specimens, in that the hind legs (like the front pair) are brown, grizzled with white behind. The white saddle is separated only by a narrow bar of brown from the white patch on the withers, which is transversely extended, and the hair of the dark dorsal streak forms a crest. A mounted specimen in the British Museum, obtained in Kashgar by the Second Yarkand Expedition, is also of the same type, although the original striking contrast in colour between the light saddle and the rest of the back is obscured by dirt; it has the hind-legs white behind below the hocks. Possibly this specimen may have been obtained from the districts to the southward of Kashgar. The horns of the Baltistan ibex are very large, and of a light brown colour.

All the ibex from Baltistan that have come under the writer's notice have the same peculiar coloration, and as they appear to be different in this respect from both the Siberian and the Himalayan races, they seem to indicate a well-marked local variety, which, if it prove distinct from the under-mentioned form, may be called *C. sibirica wardi*, after Mr. Rowland Ward, the donor of the type specimen to the British Museum.

The exact limits of the range of the Baltistan ibex must be left

for future determination. Within the area treated of in the present volume, apart from the Kashmir neighbourhood and the main Himalayan range, ibex occur in the Herat district and other parts of Afghanistan, in the Gilgit neighbourhood, and in Baltistan.

An ibex believed to come from the valley of the Irtish, which drains the Semipalatinsk Altai and flows into the Obi, has recently been described by Mr. Walter Rothschild¹ as *C. sibirica lydekkeri*, and is evidently nearly related to the Baltistan form. The horns of the bucks are remarkable for their great thickness from back to front, and have somewhat irregular knots. In the male the general colour of the fur, both above and below, is wood-brown, with a large buffish saddle (traversed by the dorsal streak) on the hinder part of the back and a smaller patch of the same colour in front of the withers. The lower portions of all four legs are entirely brown—dark brown in front and golden brown behind—but the thighs may be whitish behind, as is sometimes the case in the Thian Shan race. In the female the hair of the whole of the under-parts is pure white. As there is no evidence that the does of the Baltistan ibex show this peculiar feature, this may prove to afford a sufficient distinction between the two forms. As it is, the chief distinction is in the golden brown of the hinder surface of the lower part of the hind-legs; the same part in the Baltistan ibex being either white or dark grizzled brown. Moreover the white neck-patch is placed more forward in the Irtish ibex, and is also considerably less wide. In view of these differences, and the apparent wide geographical separation of the two forms, it seems inadvisable, for the present at least, to unite them. It may be added that the Irtish specimens were obtained in company with the Siberian roe (*Capreolus pygargus*) and Littledale's sheep (*Ovis sairensis*), while the Baltistan animal associates with the Astor markhor.

¹ *Novitates Zoologicae*, vol. vii. p. 277, pl. xi. (1900).

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The longest horns of the Asiatic ibex (including all its races) recorded in Mr. Rowland Ward's book measure 56 inches along the curve, and were obtained from the Tagdumbash district. Horns from the neighbourhood of Gilgit and Baltistan are known of which the respective lengths are $54\frac{3}{4}$, $53\frac{1}{4}$, and 52 inches, while the basal girth ranges from 10 to $11\frac{1}{2}$ inches. Some or all of the three last-named specimens belong to the typical race. In the Himalayan ibex the maximum recorded length is $51\frac{1}{2}$ inches.

So much has been written with regard to the habits of the Asiatic ibex, that a short notice will suffice on this occasion. Mr. Darrah, whose specimens were obtained in the Gilgit district, which may be within the area of the present race, has given, in *Sport in the Highlands of Kashmir*, the following excellent and concise account:—"Ibex and markhor," he writes, "seem only to move morning and evening. During the day they lie in covert, or under rocks, or on snow, usually in some inaccessible spot, far up on the ranges amongst which they are found. They go downwards in the evening for the sake of such grazing as the barren mountains they frequent produce, which is naturally best at the lowest elevations. In the mornings they graze their way upwards again to the places they occupy during the day. Here, while the others sleep, one or two of the herd carefully watch the hill-sides below them, ready to give the alarm at the first appearance of danger. Consequently they cannot be approached from below at all. And from above they are almost equally hard to reach, though for different reasons. Ibex delight in snow, and usually get up as far as possible—so far, indeed, that it is generally a practical impossibility to get above them. . . . Such being the habits of these two species of goat, the mid-day halt became a necessity, and the morning and evening were alone devoted to searching the hill-sides."

The same writer, like all those who have described ibex-stalking,

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was much struck with the marvellous vitality of these animals, which when hard hit will frequently go a considerable distance as if nothing were amiss. One which Mr. Darrah eventually secured travelled a long way, without showing much signs of suffering, when it had received five bullets.

DAUVERGNE'S IBEX

(*Capra sibirica dauverguei*)

Brief mention may be made in this place of certain ibex heads purchased in the bazaar at Srinagar, and named by Mr. R. A. Sterndale *Capra dauvergnei*. The horns are remarkable for their sharp curve, and the absence of knots on the front surface except towards the tips. The longest pair measured 52 inches. It is suggested that these specimens came from the districts to the west of Kashmir. The absence of knots, if it were confined to a single specimen, might be attributed to an abnormality ; but its occurrence in three specimens is against this view.¹

THE HIMALAYAN IBEX

(*Capra sibirica sasin*)

(PLATE IV. FIGS. 2, 2a)

It is a matter for regret that at the present day complete skins of the Himalayan race of the Asiatic ibex are almost unknown in English collections. From the description of sportsmen it appears, however, that it is a very light-coloured animal, without the light saddle of the Baltistan and Irtish races, and with uniformly brown legs, which features, as well

¹ In *Wild Oxen, etc.*, p. 285, more weight is given to the idea of these specimens being abnormalities.

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as its lighter colour, serve to distinguish it from the typical Thian Shan and Siberian representative of the species.

In describing the Himalayan ibex, apparently from specimens obtained in the Wardwan valley, General A. A. Kinloch, in *Large Game Shooting in Thibet and the North-West*, writes as follows:—"The prevailing colour is a dirty white, with a ridge of coarse chocolate-coloured hair along the back ; the lower-parts, legs, and some irregular patches are of the same dark tint." Again, General D. Macintyre, on p. 109 of *The Hindu Koh*, gives a very similar description of Wardwan ibex, but notices a seasonal change. "The colour of the ibex," he writes, "is not easily described, as, like that of most wild animals, it alters considerably at different seasons of the year, and some bucks are very much darker than others. In the spring it is a very dirty white, shaded off on the shoulders and flanks into a brownish grey, which merges into brown on the legs. A brown line runs along the back, ending in a very dark brown short tail. The head and neck are reddish brown, and a nearly black beard, about six inches long, depends from the chin. Late in the season the dirty white becomes more decidedly brown."

In both these descriptions it will be noticed that the legs are spoken of as uniformly brown ; and Mr. Blanford (*Mammals of India*, p. 504) states that the same was the case in a Himalayan skin examined by himself. No mention is made in either description of the white saddle and dark surrounding fur which forms such a conspicuous feature of the Baltistan ibex. And it therefore seems, so far as the material available admits of forming an opinion, that the Himalayan, Baltistan, Irtysh, and Thian Shan ibex are all entitled to rank as separate races of one very variable species.

Exclusive of the Pir Panjal, and apparently the Kaj-nag range, this ibex inhabits the higher elevations of the Himalaya from the neighbourhood of Kashmir at least as far eastwards as the source of the Ganges.

Not improbably it extends as far westwards as the bend of the Indus above Gilgit; and ibex have been shot in the Nubra valley, north of Leh, as well, perhaps, as in other parts of Ladak. These Ladak ibex might be considered as belonging to the Thian Shan race, were it not for the circumstance that the Ladak argali is distinct from that of the Altai. Skins are, however, necessary in order to determine this point. Ibex probably also occur to the north of Lhasa and Shigatze, but in the absence of specimens it is quite impossible to say anything with regard to the race to which they belong.

It may be added that true ibex (that is to say, exclusive of the wild goat and the so-called tur of the Caucasus and Spain) form a well-defined group of the genus *Capra*, with several distinct species, ranging from the Alps and the mountains of Northern Africa and Arabia to those of Central and Northern Asia.

THE ASTOR MARKHOR

(*Capra falconeri*)

NATIVE NAMES.—*Markhor*, PUSHTU, PUNJABI, AND SOUTH KASHMIRI; *Rache*, *Raphoche* (male), AND *Rawache* (female), LADAKI; *Rezkuh*, *Matt* (male), AND *Hit* OR *Haraf* (female), BRAHUI; *Pachin* AND *Sara* (male), *Buzkuhi* (female), BALUCHI

(PLATE IV. FIG. 3)

Although, as stated above, ibex are represented by several species, and have a comparatively wide geographical distribution, the magnificent goat generally known by its Pushtu name of markhor (snake-eater) is restricted to the mountains of Afghanistan, Kashmir, Baltistan, and the neighbouring districts, where it is represented by a single species only. This species

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varies, however, locally to such a degree in the form of its horns that were only the extreme modifications known they would certainly be entitled to rank as separate species. The intermediate forms serve, however, to connect these extreme types so closely as to indicate that they are really nothing more than races of a single very variable species. In other words, the extreme types may be regarded as incipient species, requiring only the extinction of the intermediate forms to permit their being regarded in the light of full-blown species. Natives for the most part fail to distinguish by name between such local modifications; and it will accordingly be understood that the native titles quoted above refer to the markhor generally.

From all the other wild representatives of the goat tribe, the markhor, in the wide sense of that term, differs so markedly that by no possibility can it be mistaken for any of its relatives; the spiral twist formed by the magnificent horns of the old bucks rendering them unlike those of all other species of the genus *Capra*, the nearest approach to them being made by those of the Spanish tur, or ibex.

Inclusive of its local varieties, the markhor may be described as a heavily-built animal, standing from about 35 to 41 inches in height at the withers, with the hair of the body very long and silky in the winter coat; under-fur, or pashm, being wanting. At all times of the year the old bucks are furnished with a flowing beard of long hair, extending downwards from the middle of the chin on to the throat and chest, whence it spreads upwards to the base of the ears and the nape of the neck. In the young bucks, on the other hand, there is none of this excessive hirsute development, the beard being confined to the chin, as in the other species of goats. It is, however, a peculiarity of this species that the does are provided with a beard very like that of the younger bucks. In the males the horns, which attain an enormous length and weight, and arise close together, are much compressed laterally, and are twisted into a spiral, of which the

front keel or ridge¹ has at first an outward direction ; the form of the spiral presenting a gradation from that of a very open corkscrew to that of an ordinary screw, of which the keels in front and behind form the thread. In young animals the front and back keels of the horns are sharp and distinct throughout their length, but with advancing age the keel on the front of the base disappears, so that the horn is here rounded. Does have very much smaller horns, of the same general spiral form.



FIG. 16.—Horns of Male Astor Markhor. From a specimen in the Collection of Mr. A. O. Hume.

As regards colour, the general hue of the winter coat is some shade of grey, and that of the summer coat reddish brown, but old males tend to become more or less whitish. The under-parts, which may be whitish, are ordinarily lighter in colour than the back ; a dark stripe runs from the knees and hocks down the front of the legs to the fetlocks ; and the tail is dark brown. In the old males the front portion of the beard is black, and that behind light grey ; but

¹ In all these wild goats this ridge begins at the back of the horn and sweeps forwards, whereas in all tame goats, even some of those with very markhor-like horns, the ridge begins in front and sweeps backwards (A. O. Hume, MS.).

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in young males and does, in which only the front portion is represented, it is wholly black. Young animals are greyish brown in colour, with a dark dorsal streak. The horns are black.

It may be added that skins of the different local races, of different ages and seasons, are much needed in our museums in order to show whether there are constant differences in colour between such races, which are at present mainly distinguished by the characters of the horns.

The markhor with the most widely-spread and most openly-twisted horns is the Astor race, in which the spiral apparently never forms more than one and a half turns. This race attains a large size, and is represented by a mounted male, as well as by a stuffed head, in the British Museum. As it is the typical representative of the species, its full title is *Capra falconeri typica*. It is found on the ranges of Astor and Baltistan; and on the confines of Hazara and Gilgit apparently passes into the Pir Panjal race, although actual observations on this point are urgently required. Horns from Astor are known respectively measuring 60 and 56 inches along the outside curve.

Since accounts of the habits of the different races of the markhor are given in *Wild Oxen, etc. of All Lands*, a very brief notice will suffice here. The present race, although inhabiting a country where there are considerable patches of forest at a medium elevation, is stated to resort to these only for the sake of protection from insects in summer, keeping at other times to the open. In winter they descend to comparatively low levels. They are sometimes seen grazing in company with ibex. Mr. Darrah, who shot these animals to the north of the great bend of the Indus above Gilgit, in the Haramosh district, writes as follows of their general habits:—"Markhor do not like snow, and seldom go higher than the snow-line, looking for crags and rocks at that elevation. It is therefore possible sometimes to get above them, but the ground they select

is usually so precipitous that nothing can be done, and they are practically as safe as ibex when lying up for the day."

THE PIR PANJAL MARKHOR

(*Capra falconeri cashmiriensis*)

(PLATE IV. FIG. 4)

Although horns of the typical Pir Panjal race of the markhor are readily distinguishable from those of typical representatives of the Astor form, there are, as already observed, specimens so exactly intermediate between the two that it is frequently a matter of difficulty to decide to which they should be assigned. It is probable that such intermediate examples occur on the confines of the respective habitats of the two races. In typical Pir Panjal heads, such as the one shown in the annexed figure, the horns are less divergent and have a somewhat less open spiral, which forms from one to two complete turns. In size the animal is fully the equal of its Astor relative, standing from 40 to 41 inches at the shoulder. Typically inhabiting the Pir Panjal range, which forms the southern barrier of the vale of Kashmir, this markhor crosses the Jhelam into the Kaj-nag, which is really the north-western continuation of the Pir Panjal. Thence it appears to extend northwards through Hazara and Chilas into Gilgit; but to the north-east of the Gilgit river, judging from the specimens obtained by Mr. Darrah, it seems to give place to the Astor race. In this district, however, as already remarked, the two races seemingly intergrade, so that no hard-and-fast lines can be drawn between their respective habitats. The longest markhor horns on record are a pair picked up on the Pir Panjal or Kaj-nag range, whose length is

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63 inches; other specimens from the same ranges respectively measure 59 and $56\frac{1}{2}$ inches, while a pair from Gilgit, referable either to the present or the preceding race, reach $58\frac{1}{2}$ inches.

By the Pir Panjal shikaries it is only to the old bucks that the



FIG. 17.—Skull and Horns of Male Pir Panjal Markhor. From a specimen in the possession of Mr. A. O. Hume.

name markhor is assigned, the younger bucks being termed rind, and the does bakri (she-goat). In both the Pir Panjal and the Kaj-nag ranges this goat is an inhabitant of the dense forests of pine and birch clothing the scarp'd hill-sides; its feeding-grounds being formed by

the intervening grassy glades. Although generally difficult to find, the old bucks are almost sure to show themselves at the first gleam of sunshine after one of the storms which at certain seasons rage so furiously on these mountains. The late summer is the season when the old bucks keep most to dense covert. In the old days markhor-



FIG. 18.—Horns of Western Markhor. From a specimen in the Collection of Mr. A. O. Hume.

shooting—to those capable of negotiating some of the most difficult ground conceivable—was one of the finest of Kashmir sports, but the numbers of old bucks with fine horns have been grievously reduced in recent years. A favourite starting-point to the ground was the nala joining the Jhelam valley at its bend below Naushahra.

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The horns represented in the figure on page 115 differ to a certain extent from those of the typical Pir Panjal markhor, and in the opinion of Mr. A. O. Hume indicate a distinct race, for which the name of western markhor is suggested. In regard to this type of horn Mr. Hume has written to the publisher as follows :—"The horns of this form, hitherto never seen on the entire skull, but usually on the frontal bone only, are brought down occasionally to Peshawar from Cabul, and again find their way sometimes into the Srinagar bazaar. They come from the west, and from a long way off, and that is all that can usually be learned about them. They belong to the cork-screw group, but differ from those of the two preceding races in being much slenderer, and also in the greater numbers of turns put in by their main ridge in any given length of horn measured straight from base to tip. In this respect they are to the Pir Panjal and Astor races what the Suleman Range ones are to those of the Cabul Mountains. The horns make a regular V, broader or narrower, but the tip-to-tip measurement never, I believe, exceeds the length straight, and usually, I think, falls at least one-sixth short of this. The Cabuli from whom the specimen figured was purchased said he believed that they came from Hazara—at the time I thought that he meant British Hazara, but I now believe he meant Afghan Hazara. I have often thought that perhaps they come from Kaffiristan, and that they form a connecting link between the Pir Panjal and Cabul races."

THE CABUL MARKHOR

(*Capra falconeri megaceros*)

The markhor inhabiting the mountain ranges of Northern Afghanistan forms the third stage in the gradation from the Astor to the Suleman representative of the species, its horns being, in fact, intermediate in

character between those of the latter and those of the Pir Panjal race, In full-grown bucks these appendages, although nearly straight, still form a slightly open spiral, or, in other words, show a tendency towards the cork-screw type so conspicuous in the two preceding races. It is probable.



FIG. 19.—Skull and Horns of Cabul Markhor. From a specimen in the possession of Mr. A. O. Hume.

indeed, that a complete gradation may be found from the Pir Panjal to the Suleman type by means of the present form, although it has yet to be demonstrated that any two of the three races in question are in the habit of herding with one another. Although measurements are lacking, it seems probable that the bodily size attained by this race is medium.

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Its habitat includes the Trans-Indus mountains in the neighbourhood of Cabul, and perhaps some of those farther to the southward : thus forming the north-westerly limits of the geographical range of the species. The longest horns recorded by Mr. Rowland Ward which can be definitely assigned to the present race are the pair shown in figure 19 on p. 117, which measure 32 inches in length.

Mr. Hume writes as follows in reference to this race :—"The Cabul horns are rare, but every specimen which I have been able to localise accurately belonged to this type. Hutton's figure of his Cabul specimen shows that it belonged to this type. Vigne's vignette in his personal narrative of the specimen killed for him in the Lughman Hills by Akhbar Khan shows that this too belonged to this type. Two specimens sent to me from Cabul are of the same type, and so too was the one huge horn which Hutton had in his possession in 1852, and of which I noted the length at 50 inches ; in reference to which he said, 'They say in Cabul that if you stand a good pair on the tips a big man can pass through them on hands and knees,' which must refer to horns at least 4 feet straight measurement. This race extends throughout the northern portions of Afghanistan which lie adjacent to Cabul—how much farther it extends in any direction is uncertain."

THE SULEMAN MARKHOR

(*Capra falconeri jerdoni*)

(PLATE IV. FIGS. 5, 5a)

The markhor of the Suleman range, on the eastern frontier of Afghanistan, has been aptly designated the straight-horned race ; the horns of the bucks, which never attain the gigantic dimensions of those of the

Astor race, forming a perfectly straight cone, upon which the front and back keels are wound in a sharp spiral, like the threads of a double-threaded screw. In fine examples, such as the one figured in the annexed



FIG. 20.—Skull and Horns of Suleman Markhor. From a specimen in the possession of Mr. A. O. Hume.

cut, two or three complete turns are formed. As regards size, this markhor is a smaller animal than the typical form, its shoulder-height apparently not exceeding about 35 inches. It is stated also that the beard is less developed—probably on the throat, chest, and shoulders—than in the Astor and Pir Panjal races, but specimens are urgently needed in order

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to test this statement, as they likewise are in order that the colour of the beard and coat may be properly described. So far as the specimen here figured admits of forming a judgment, it appears that the beard on the chin and upper part of the throat is at least as fully developed as in the typical race. The habitat of the straight-horned markhor includes the Trans-Indus hill-ranges of the Punjab frontier, together with those of south and eastern Afghanistan and Baluchistan. In the Suleman range this goat is found as far south as the neighbourhood of Mithankot, and it also occurs in the Quetta district, where, however, the horns are stated to show a tendency towards the assumption of a less compact spiral. The longest horn on record is a single one picked up on the Suleman range, of which the length is $48\frac{1}{2}$ inches. Next to this is a pair in the British Museum, from Afghanistan, measuring $39\frac{3}{8}$ inches, while the third in point of size is the head herewith figured, in which the horns are $39\frac{1}{4}$ inches in length.

The hill-ranges frequented by the straight-horned race of the markhor are comparatively barren and bare, and in summer are subject to a heat equalled in but few parts of India. Consequently the habits of the animal must be very different to those of its forest-dwelling relative on the snow-clad scarps of the Pir Panjal. Unfortunately, the life-history of this goat still remains to be told; and all that can be said at present is that, compared with the Astor race of the species, the Suleman markhor is the exact counterpart, so far as its habitat is concerned, of the urial of the Salt range, as contrasted with the urin, or sha, of Astor and Ladak.

Mr. Hume writes that "the horns of the females, though smaller and slenderer, are of the same general character as those of the males, but they differ in two noteworthy points. First, the back or main ridge seems always more rounded and never so sharply pinched up as in the male. Second, the secondary ridge, which never I believe shows itself in the male lower than the end of the first half turn of the horn, in the female runs

right down on to the frontal point, and is there fully as prominent as the main ridge behind. In this respect, therefore, the female horns are just half-way between those of the males of the wild and tame goats respectively of this general type.

“This race occurs right down the Suleman range from Kohat to



FIG. 21.—Head of Suleman Markhor. From Mr. A. J. Grant's Waziristan specimen.

opposite Mithankot. It also occurs on certain high hills not far from Quetta, but not farther south in Baluchistan proper, nor, Sir O. B. St. John informed me, according to the Afghans, north of Kandahar in Afghanistan, though he himself considered it likely that it extended through the higher eastern hills away inland from the Suleman.”

THE HIMALAYAN TAHR

(Hemitragus jemlaicus)

NATIVE NAMES.—*Tehr* or *Jehr* IN THE WESTERN HIMALAYA ; *Kras* AND *Jagla*, KASHMIRI ; *Jhula* (male) AND *Tahrni* (female) IN KUNAWAR ; *Esbu* IN THE UPPER SUTLEJ VALLEY ; *Kart* IN KULU AND CHAMBA ; *Jharal*, NEPALI

(PLATE IV. FIG. 6)

In spite of the circumstance that its distinctness was pointed out and a name proposed for it by the late Mr. Brian Hodgson so far back as 1841, the Himalayan tahr was for many years included by a number of naturalists in the genus *Capra*. Wiser counsels have, however, at length prevailed, and, together with the allied forms, it is now regarded as representing a genus apart. The short-horned goats, as the various species of tahr may be collectively termed, are distinguished from the true goats by the absence of the beard in the bucks, and the comparative shortness of their horns, which are placed close together at the base, and do not greatly exceed the length of the head. A further distinctive feature being found in the fact that the horns of the females are but little smaller than those of the males, thereby indicating a transition from the true goats in the direction of the serows and gorals. The bucks exhale the same strong odour as those of the true goats. The muzzle bears a small naked area ; but glands are wanting alike on the face and in the feet. A remarkable difference between the females of the two Indian representatives of the genus is that whereas one has four teats, the other bears but two. The horns are black in colour, and spring from the skull in the plane of the forehead, curving smartly backwards ; they are much compressed, with the front edge angulated.

The true, or Himalayan tahr, which forms the type of the group, is a long-haired and shaggy animal ; so shaggy, indeed, that stuffed specimens, in which the hair has to be combed out during the process of preparation, scarcely ever exhibit this very characteristic feature in its full perfection. In height the animal stands from 36 to 40 inches at the withers ; and it is of somewhat heavy and clumsy build, with a remarkably long, narrow, and straight face. The horns of the bucks, which are almost, if not completely, in contact at their bases, are much compressed, and for some distance flattened on both sides ; the lateral surfaces are distinctly marked with transverse striæ, and the front angle forms a sharp keel, bearing at intervals small knob-like elevations ; after diverging from their bases, and curving sharply backwards, the horns become slightly convergent towards their tips. Although the hair on the head and face is for the most part short, elsewhere it is long and soft, attaining its maximum length and shagginess on the neck, shoulders, and chest of the old bucks, where it forms a huge mane, extending at least as far downwards as the knees. Darker in old males than in younger bucks and females, the general colour of the hair of the tahr may be described as reddish or dark brown ; some individuals are, however, paler coloured than others, and in the old bucks the fore part of the mane tends to assume a more or less conspicuous whitish or hoary tinge. When the coat is turned back, the hairs will be found to be pale-coloured at the root and dark brown at the tip. The face, as well as the front surfaces of the legs, are of such a dark shade of brown as to appear almost black in some examples ; and a dark streak runs down the back, although in old males this becomes very indistinct. In the bucks the hinder surface of the legs is a pale or rusty red. Immature tahr of both sexes are greyish brown, while the kids are very pale coloured. The short and flattened tail is devoid of hair on its under surface, as are the hard pads, or callosities on the knees, and the female is provided with two pairs of teats. About 200 lbs. may be given as the

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approximate weight of a full-grown male tahr. The lengths of the four largest pairs of tahr horns recorded by Mr. Rowland Ward are $14\frac{3}{4}$, $14\frac{5}{8}$, $14\frac{9}{16}$, and $14\frac{1}{2}$ inches; the basal girths of the two latter examples being respectively $8\frac{3}{4}$ and $9\frac{3}{4}$ inches. Three of these fine specimens were obtained in Chamba; the locality of the fourth being unknown.

It is a remarkable fact in connection with this tahr that it retains its long coat at all seasons of the year; the same being to a great extent the case with the Astor and Pir Panjal markhor. In this respect it offers a striking contrast to its not very distant cousin the Rocky Mountain goat, in which the summer coat is quite short. As the habitat of the tahr in summer is probably much warmer than that of the Rocky Mountain goat at the same season, the difference in the above respect seems inexplicable.

The true tahr is a typical Himalayan animal, inhabiting the forest districts of the middle ranges of that chain from the Pir Panjal to Sikhim, and being especially abundant in the Lower Wardwan valley, the Kistwar district, and Chamba. Although it is very difficult to obtain accurate information as to the precise geographical limits of animals in Kashmir, so far as the writer is aware, the tahr does not occur in the mountains to the north of that valley, nor in the Kaj-nag range.

Tahr inhabit, perhaps, the very worst ground on which it is possible for a large mammal to exist; and it is to this that many sportsmen, including the present writer, owe the loss or destruction of some of their finest trophies (for, of course, lost specimens are always much superior to those safely bagged!). They are essentially forest animals, and generally prefer the steep slopes, more or less clothed with trees, to the bare mountain-tops, to which, however, they will occasionally wander. Till the autumn the old bucks keep apart from the herds during summer, generally ascending to a higher elevation. The pairing season occurs in winter, and the kids, of which there is usually but one at a birth, are dropped in June or July.

THE NILGIRI TAHR

(Hemitragus hylocrius)

NATIVE NAMES.—*Warri-adu*, OR *Warri-atu*, TAMIL ; *Kard-ardu*,
CANARESE ; *Mulla-atu*, MALABARI

(PLATE IV. FIG. 7)

Although it has several local titles of its own, while it is commonly known to British sportsmen by the distinctly inappropriate name of Nilgiri ibex, the present species may be much more appropriately termed the Nilgiri tahr, since it is a comparatively near relative of the Himalayan species, with which, and a third form found in Southern Arabia, it constitutes the existing representatives of the genus *Hemitragus*. The isolated distribution of the present animal is exceedingly interesting, since it indicates that at some former epoch of the earth's history conditions must have obtained permitting the existence of tahr in the country between the Himalaya and the Nilgiris.

In size the Nilgiri tahr is somewhat superior to its Himalayan relative, the bucks standing from 39 to 42 inches at the withers, although the does do not appear to exceed about 35 inches. From the Himalayan species the present animal is broadly distinguished by its generally short and stiff coat, by the very prominent convexity of the outer surface of the horns, and likewise by the presence of only a single pair of teats in the female ; the reason for the last-named point of difference being very difficult to understand, since, as already mentioned, in the Himalayan tahr only a single kid is commonly produced at a time, and there never appear to be more than two.

The face of the Nilgiri tahr exhibits a slight degree of concavity on the forehead and a corresponding tendency to convexity at the

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lower part of the nose. With the exception of being lengthened to form a low and stiff mane on the back of the neck and shoulders in the bucks, the hair is uniformly short, thick, and coarse throughout, probably exhibiting little or no difference between the summer and winter coats. Almost in contact at their bases, the horns of fully adult bucks are nearly parallel to one another for some distance, after which they become gradually divergent, their curvature forming a bold and regular sweep. Throughout their length they are marked by conspicuous transverse wrinkles, and while the inner surface is nearly in one plane, the outer surface is highly convex; along the front inner angle runs a sharp keel, but the hinder surface is completely rounded off. The general colour of the hair may be described as dark yellowish brown, but greyer in the does and kids, with a dark streak down the middle of the back, and becoming distinctly paler on the under surface of the body. The old bucks are even darker than usual, being of a sepia-brown tint, which passes into blackish on the face; they have a fawn-coloured ring round the eye, a grizzled grey streak down the side of the face, and a patch of the same colour behind the eye; but their most conspicuous mark is a large grizzled white saddle-shaped area on the loins, which in very old bucks turns almost pure white. From this the patriarchs of the flock take their colloquial name of "saddle-backs." The legs, which are blackish brown in front and paler behind, are likewise more or less grizzled in old males.

The largest horns of this species on record have a length of $17\frac{1}{2}$ inches along the front curve, with a basal circumference of $9\frac{7}{8}$ inches; the corresponding dimensions of the second best specimen being 17 and $9\frac{3}{4}$ inches. Neither of these examples were, however, measured by Mr. Rowland Ward, the largest specimen that he has handled measuring $16\frac{3}{4}$ inches in length, and $8\frac{7}{8}$ in basal circumference; it forms an item in the magnificent series of Indian big game trophies

collected by Mr. A. O. Hume. The largest female horns on record have a length of $12\frac{3}{8}$ inches, and a basal girth of $5\frac{1}{2}$ inches.

The Nilgiri tahr is an inhabitant of all the chief mountain ranges of Southern India, including the Nilgiris, the Anamalais, and the Western Ghats, from the latter chain nearly as far down as Cape Comorin. Although occasionally found at considerably lower levels, these goats are usually to be met with at elevations of between 4000 and 5000 feet above the level of the sea.

Before it had been so much thinned by excessive shooting, the Nilgiri tahr was to be met with in flocks whose numbers commonly varied between half-a-dozen and half-a-hundred head; while in rare instances, when two or more flocks had temporarily joined forces, the numbers might considerably exceed these. Although occasionally seen on the upland grassy plateaux so characteristic of the hills of South India, these goats prefer the scarps and crags above the level of the forest, where they graze on the patches of grass which occur in suitable spots. Their feeding-times are the mornings and evenings, the hottest hours of the day being passed in repose and cud-chewing beneath the shelter of tall rocks. Some of the does act as sentinels, keeping watch and ward so vigilantly that to approach within range requires all the skill of the sportsman. There does not appear to be any definite breeding-season; and it is stated that there are commonly two kids at a birth. If this be true, and also that the Himalayan species has usually but one, the smaller number of teats in the Nilgiri tahr is certainly a very remarkable fact. Leopards, and more rarely tigers, thin the flocks to a great extent; while the numerous packs of wild dogs which hunt on the Nilgiris must likewise take their quota. Of recent years these animals have been specially protected by law; and the writer has been informed by an officer stationed in Madras, that in consequence of these regulations their numbers are now steadily on the increase.

THE SUMATRAN SEROW

*(Nemorhædus sumatrensis)*NATIVE NAMES.—*Tau-tshiek*, BURMESE ; *Kambing-utan*, MALAY

In the case of popular names of animals which, although originally applied to one species, have been subsequently expanded so as to include a group of more or less nearly allied forms, there is frequently a difficulty in deciding the limits to be employed in this more extended usage. And no better example of this difficulty exists than in the use of the term "antelope." Originally applied, as mentioned below, to the blackbuck of India, the name has been in later times used to denote a vast assemblage of horned animals which come under the denomination neither of cattle, sheep, or goats, and the only question is whether it should be still further extended so as to include the European chamois, the so-called Rocky Mountain goat, and the subject of the present notice. In the cylindrical form of their horns the serows are, indeed, much more similar to some of the antelopes than they are to any of the goats. But, on the other hand, in their clumsy build, heavy limbs, and stout hoofs, as well as in their habits, they undoubtedly come nearer to the goats. And, in order to express this dual relationship, they have been called by some writers goat-antelopes. That term is, however, a somewhat cumbrous and inconvenient one, and, on the whole, it appears preferable to call them by the name by which they are commonly known in the North-West Himalaya, viz. serow, or, correctly, sarao.

And here it may be well to mention that as this name properly belongs to the Western Himalayan representative of the group, the reader may wonder why the Burmese animal (whose native name *Kambing-utan*

signifies wild goat) is not taken first. The reason is not far to seek. The two animals are evidently nothing more than local races of one and the same species; and it happens that while the Malay form was scientifically described as early as the year 1801, the Himalayan animal was not made known to the scientific world till 1832, when it was described by Brian Hodgson, who was the fortunate discoverer of so many previously unknown animals and birds of the Himalaya. Consequently the scientific name of the Malay race, as the earlier, becomes the distinctive title of the species, so that this typical race demands priority of treatment.

As already said, the serows are heavily built, ungainly, mountain ruminants, of about the size of an average English donkey, with long, shaggy, coarse hair. They are specially distinguished by the circumstance that both sexes are furnished with horns which display but little inferiority of size in the females as compared with the males; and that these horns are comparatively short, conical, and marked in their lower portion by a number of low, closely approximated rings, and partially interrupted longitudinal grooves. In colour they are jetty black, and their direction is at first nearly coincident with the plane of the face, but towards the tips they curve slightly backwards, and at the same time diverge to a small degree from each other. Nine and a half inches is the maximum recorded length of the horns of the typical race of the Sumatran serow.

In height the present animal stands about $34\frac{1}{2}$ inches at the shoulder. In addition to its heavy and clumsy build, the serow is characterised by the proportionately large size of the head, and the large mule-like ears, as well as by the short and thickly-haired tail. Face-glands, opening by a small circular orifice below each eye, are present; and the muzzle is bare and moist, like that of cattle. Glands are developed between the hoofs of all four feet, but there are none in the groin. The udder of the female is furnished with four teats. The upper cheek-teeth are generally

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similar to those of the sheep. The coarse and rather thin hair covering the head and body is of moderate length, but is developed so as to form a rather longer crest running from the nape of the neck to the withers. Since the colour of the Himalayan race of the species is described at some length, it will suffice to say that the Sumatran, or eastern representative of the species is specially characterised by the lower part of the legs being rufous, instead of white or grey, as well as by the more rufous tinge of the hair generally. Apparently also the size is not equal to that of the largest specimens of the Himalayan race, although small examples of the latter do not exceed the present form in this respect.

Probably, however, there is a complete transition from the one race to the other, since some years ago a specimen was killed by General A. A. Kinloch near Darjiling, which in point of colour was intermediate between the two. The geographical range extends from the island of Sumatra through the elevated tracts of the Malay Peninsula, Siam, Burma, and Assam, to the Eastern Himalaya. It is commonly called the Burmese serow, but as it is typically from Sumatra it is better indicated by the name under which it is here given. It would be still better if another title could be invented for the species, and the local races denoted by their geographical designations. The name "serow" alone would not suffice, as there is a Japanese as well as a Formosan species of the genus.

In habits the Sumatran serow is probably identical with the Himalayan race, although it inhabits somewhat lower elevations.

THE TIBETAN SEROW

(Nemorhædus sumatrensis milne-edwardsi)

This representative of the species, which was originally described by the Abbé David from Moupin in Eastern Tibet, but subsequently recorded by Dr. J. Anderson from Yunnan, resembles the typical race in the rufous lower portion of the legs, but differs by the uniformly brownish-black colour of the upper-parts. There is also a woolly under-fur to the coat, which appears to be generally wanting in the other races.

Dr. Anderson states that a horn of this serow is generally an indispensable adjunct to the shoulder-bag, or haversack of every Kakhyen, Shan, and Chinese peasant of Western Yunnan, from which it is suspended, and serves the purpose of a drill in repairing harness, etc.

THE ARAKAN SEROW

(Nemorhædus sumatrensis rubidus)

Although generally regarded as identical with the typical race of the species, the Arakan serow appears entitled to be regarded as third local form, distinguished by the extremely red tinge of the coat. It appears also to be an unusually small form, but further information with regard to it is urgently needed. It was originally described, as a distinct species, by the late Edward Blyth, under the name of *Capricornis rubida*, in his *Catalogue of the Bengal Asiatic Society's Museum*.

THE HIMALAYAN SEROW

(Nemorhædus sumatrensis bubalinus)

NATIVE NAMES.—*Sarao* IN THE NORTH-WEST HIMALAYA ; *Ramu*, *Halj*, *Salabhir*, KASHMIRI ; *Goa* IN CHAMBA ; *Aimu* IN KUNAWAR ; *Yamu* IN KULU ; *Tehr* IN NEPAL ; *Gya* AMONG THE BHOTIAS OF SIKHIM ; *Sichi* OF THE LEPCHAS

(PLATE V. FIGS. 2, 2a)

The Himalayan sportsman will often be deceived as to the nature of the game which he is pursuing, owing to the circumstance that the name used in one district to denote a certain species is applied in another to a totally different animal. An example of this confusion occurs in the present case, where the serow of the North-West Himalaya is termed tahr in Nepal, where the animal to which that title is restricted in works of natural history is known as jharal. On the other hand, in Chamba we find the serow figuring as the goa, a name properly pertaining to the Tibetan gazelle ; while in the Suleman range the name sarao is applied to the markhor, and in Sind to the wild goat.

As mentioned above, the Himalayan serow is nothing more than a local race of *Nemorhædus sumatrensis*, from the typical, or Sumatran form of which it is distinguished by the greyer tone of the whole pelage, and more especially by the circumstance that the lower parts of the legs are white or grey, instead of being of the same rufous tinge as the hair of the body. The height, too, is frequently greater than in any specimens of the Sumatran serow of which measurements are available, and the horns are often larger than in any recorded examples of the latter. The maximum horn-measurements recorded by Mr. Rowland Ward are as follows : length,

12 $\frac{1}{4}$; basal circumference, 6 $\frac{1}{2}$; and tip-interval, 2 $\frac{3}{4}$ inches ; these being taken from a Garhwal specimen in the possession of Mr. A. O. Hume. Next to this we have examples respectively measuring 12 and 11 inches in length, while there are five specimens on record varying between 10 and 10 $\frac{1}{2}$ inches. The height of the animal at the shoulder apparently ranges between 33 and 37 or 38 inches, while its weight varies between 120 and 190 pounds.

As regards colour, the Himalayan serow may be described as blackish or dark grey on the upper-parts, with a generally grizzled appearance, owing to the whitish bases of the hairs, the head and neck being black. On the flanks, buttocks, upper portion of the limbs, chest, and throat the black of the back passes into rusty red, which in turn gives place on the under part of the body, the inner side of the thighs, and the lower portion of all four legs to dirty white or greyish ; the inside of the ears and the front and sides of the chin being likewise white, but of a purer tint. Frequently a black line down the back can be more or less clearly distinguished.

The range of the Himalayan serow extends along the outer and middle Himalaya from Kashmir to the Mishmi Hills, at elevations between about 6000 and 12,000 feet. So far as the present writer is aware, in Kashmir the animal is only found on the south side of the valley in the Pir Panjal range, and it apparently does not cross the Jhelam into the Kaj-nag range. It occurs in Chamba, probably on the south side of the Chinab in Pangi, and certainly in Kulu and Nepal, as well as in the interior of Sikhim. As noticed under the heading of that race, it probably passes into the Sumatran form somewhere in the neighbourhood of Darjiling. Curiously enough, this race has also been recorded from Yunnan, in some parts of which country the Sumatran form is likewise met with.

Serow share with tahr the notoriety of frequenting the very worst ground the Himalaya can show ; and only those who have had practical experience can realise how bad this can be. Not only does a serow go

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across an almost perpendicular face of rock as easily as if it were horizontal, but it has a habit of choosing ground covered with slate debris, on which progress is most difficult to the sportsman. A solitary animal, and nowhere abundant, it is never found far away from wood, and often takes up its abode in thick forest, or scrub-jungle; the description known as ringal-jungle, which is mainly formed by a long thin reed-like bamboo, being an especial favourite in the more Eastern Himalaya.

Although the present writer has travelled over many miles of serow-country, he was never fortunate enough to come across one of these ruminants in the flesh. Good accounts of its habits are, however, given by General A. A. Kinloch in his *Large Game Shooting in Thibet and the North-West*, as well as by General D. Macintyre in the little sporting volume entitled *The Hindu-Koh*.

From these accounts it appears that serow are in the habit of spending most of the day concealed among the gloomy recesses of the wooded precipitous gorges which form their favourite haunts, from which they usually issue to feed only in the evenings and early mornings, and even then wander but short distances from their headquarters. Shyness seems indeed to be one of the most characteristic traits of this animal, although when attacked or brought to bay, none displays greater boldness. As an illustration of this, General Macintyre states that when the follower of an English sportsman was proceeding to secure the body of a female serow that had been shot by his master, the male suddenly rushed out from some dense covert in which it had been concealed, and with one butt sent the unfortunate man rolling down the hill-side, without giving the chance of a fair shot to the astonished sportsman looking on. This instance shows that although serow are frequently seen alone, they may also be found in pairs. Very little difference in general appearance distinguishes the does from the bucks; and as the former have nearly as large horns as the latter, they are legitimate game to the sportsman. When serow cannot be stalked on their

feeding-grounds, they may sometimes be induced to break covert by driving, although not unfrequently the difficult nature of the country renders this method impracticable. When alarmed, the serow gives utterance to a series of sharp, shrill screams, or shrieks, repeated at short and regular intervals, and much resembling the cries of its smaller relative the goral. When first heard, they are decidedly alarming to the sportsman. Many species of ruminants when suddenly surprised seem to "lose their heads" for a few seconds, and in the serow this momentary bewilderment is especially noticeable, the animal standing stock-still, as if dazed, and this, too, in some instances after it has been fired at. When, however, the animal has got over its bewilderment it starts off with a rush headlong down the precipitous mountain-side, in a manner which generally renders pursuit altogether out of the question. Occasionally the alarm scream is uttered without any apparent cause. When wounded and charging, the eyes display a peculiar red gleam, which gives an almost fiendish appearance to the entire animal.

Some difference of opinion exists in regard to the time when the ewes give birth to their progeny, Brian Hodgson stating that this takes place in September or October, after a gestation of eight months, whereas Leith-Adams gives the time as May or June. Apparently a single kid is produced at a birth. The serow has never been exhibited alive in England, and probably nowhere in Europe, even if it has been captured in India.



FIG. 22.—Skull and Horns of Himalayan Serow. From a specimen in the possession of Mr. A. O. Hume.

THE HIMALAYAN GORAL

(Urotragus goral)

NATIVE NAMES.—*Goral* IN THE NORTH-WEST HIMALAYA; *Pij*, *Pijur*,
Rai AND *Rom*, KASHMIRI; *Sah* OR *Sar* IN THE SUTLEJ VALLEY;
Suh-ging OF THE LEPCHAS; *Ra-giyu* OF THE BHOTS OF SIKHIM;
Deo Chagal IN ASSAM

(PLATE V. FIG. 3)

Owing to the well-known practice of applying the names of European animals to their more or less distant relatives in other countries, the goral is very generally known among sportsmen as the Himalayan chamois. But beyond the fact that it belongs to a group of ruminants in some degree serving to connect the antelopes with the goats, it has really very little in common with the chamois, from which it differs by its shaggy coat, as well as in its more sombre coloration, and in the form of its horns. It is, in fact, a near relative of the serows, from which it is mainly distinguished by the absence of glands on the face, and in certain details of the skull. Very generally the gorals are known by the name of *Cemas*, but, although earlier, that title has to give place to *Urotragus*.

In most characters, such as the naked muzzle, the presence of glands in the feet, and of four teats to the udder of the female, as well as in the development of horns in both sexes, the gorals resemble the serows; the absence of face-glands being the chief reason for referring them to a separate group. Very generally the tail is comparatively short (about 4 inches in the Himalayan species), but it attains a considerable length in the long-tailed goral (*U. caudatus*). As a rule, the gorals are smaller animals than the serows, but there is a species of the latter from Japan (*Nemorhædus crispus*) which is no larger than a goral.

In all the gorals the short and insignificant-looking black horns, which are nearly as large in the does as in the bucks, are very similar to those of the serows, being conical and but slightly divergent, curving evenly backwards, and marked for the greater part of their length by somewhat irregular, closely approximated rings, or ridges, which are partially interrupted by longitudinal groovings. The general form of the animal is



FIG. 23.—Female Goral. From a photograph by the Duchess of Bedford.

also goat-like, with the limbs strong and stout. The hair, too, is rather coarse and shaggy, with a certain amount of woolly under-fur at the roots, and generally showing a tendency to develop into a slight crest along the back of the neck and at the bases of the horns.

The Himalayan species stands from 26 to 28 inches in height at the withers, and weighs from about 58 to 63 lbs. As already said, it has a comparatively short tail. Its general colour is brown, showing a more or less marked individual tendency either to rufous or greyish, and with the

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under-parts but slightly paler than the back. The face is somewhat paler and more distinctly rufous than the back, but becomes darker nearer the horns; the throat is white; a black line runs down the front of each leg, and another from the nape of the neck along the back to the tail, which is likewise black; and the lower parts of the legs, exclusive of the black streak in front, are rufous brown. The maximum recorded length of goral horns is $8\frac{1}{2}$ inches, one pair of these dimensions, from Bissahir, being in the possession of Major A. E. Ward, while a second (a female from Dalhousie) belongs to Mr. J. Johnston-Stewart. Three specimens measuring 8 inches in length are known, one of them having a basal girth of $3\frac{3}{4}$ inches, and an interval of $3\frac{1}{8}$ inches between the tips; two of these specimens are from Chamba, and the third from Kumaon.

The Himalayan goral is an inhabitant of the outer and middle ranges of that chain of mountains from Kashmir to Bhutan, and is also said to occur in the Naga Hills, to the south of Upper Assam, while Mr. C. W. A. Bruce has shot young specimens in Upper Burma.¹ In Kashmir it is probably restricted to the ranges to the south of the valley; in the Siwalik Hills it is represented to be far from abundant, but in most districts it is very common, and is not unfrequently found in the neighbourhood of hill-stations. The lowest elevation at which it occurs is about 3000 feet, and its highest range about 8000 feet.

Never found away from forest, goral usually associate in small parties of from four to eight head, and where one is seen others are almost sure to occur; old bucks are, however, solitary for the greater part of the year. Grass-clad hills, or ledges among steep cliffs, and rocky ground in the midst of forest form their favourite haunts; and sometimes the country they frequent is so precipitous that a wounded animal will fall several hundred feet before its body finds a resting-place, General Macintyre mentioning

¹ The Burmese goral may prove to be a distinct sub-species, but this cannot be ascertained until fully adult specimens are available for comparison.

an instance where a goral he had shot fell headlong for a height of about 1000 feet. Like the majority of Himalayan ruminants, goral usually feed only in the mornings and evenings, taking a long *siesta* during the mid-day heat; but on dull and cloudy days they may be seen abroad at all hours. The period of gestation is about six months, and the kids, of which there is usually but one at a birth, are born during May and June. Being such an exceedingly common animal, it is somewhat surprising to find that up to the year 1896 only a single example of this goral had been exhibited in the London Zoological Gardens. At Woburn Abbey there have, however, been numerous living examples, one of which is now mounted and exhibited in the British Museum.

In spite of the insignificant character of the horns as trophies, goral-shooting has a considerable attraction for many Himalayan sportsmen, especially those who dislike the weary mid-day halts inseparable from most kinds of big-game stalking, or who object to sleeping out on the bleak hill-sides. As General Macintyre remarks: "On the precipitous and broken ground of the Middle Himalayan ranges this kind of stalking is perhaps one of the pleasantest descriptions of sport." When the goral are taking their mid-day nap, the sportsman can nearly always return to his tent for lunch; and, in any case, he can make sure of a night in bed. In good localities blank days are, moreover, few and far between; the writer last mentioned having bagged no less than sixty head of these game little ruminants during a single season's shooting.

THE ASHY TIBETAN GORAL

(*Urotragus cinereus*)

This, like the next species, is one of the numerous species of animals discovered by the missionary, Abbé David, in the Moupin district of Eastern

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Tibet, and described by the late Professor Milne-Edwards of the Paris Museum. In the type specimen the horns measure $7\frac{1}{2}$ inches in length.

Compared with the next species the present animal is stated to be decidedly larger, and its fur is of a more nearly uniform colour, being more distinctly of an ashy tint, and less mingled with brown. Moreover, the whitish areas on the under surface of the neck and on the feet are of smaller extent and less suffused with yellow. More important than all is the greater length and bushiness of the tail, which is not inferior in these respects to the Mongolian long-tailed goral (*U. caudatus*). The describer adds that he should have hesitated to distinguish this species from the next were it not for important differences in their skulls, that of the present animal, in addition to other points of distinction, being much more elongated.

The two animals are stated to be recognised as different from one another by the natives of Eastern Tibet, who affirm that the present one lives at a higher altitude than the next. Both are distinguishable from the Himalayan goral by the character and colour of the pelage, as well as by their longer tails.

THE GREY TIBETAN GORAL

(*Urotragus griseus*)

Although it may seem somewhat curious to find two nearly allied species of the same genus inhabiting the same district, yet in the opinion of Professor Milne-Edwards this goral is entitled to specific distinction from the preceding; and as a matter of fact it is not uncommon to find a larger and a smaller representative of the same type of animal in one area.

The present species, which inhabits the Moupin district of Eastern





PLATE V

- | | |
|----------------------------------|------------------------------------------|
| 1, 1 <i>a</i> . Mishmi Takin. | 6. Four-horned Antelope. |
| 2, 2 <i>a</i> . Himalayan Serow. | 7, 7 <i>a</i> . Indian Chinkara Gazelle. |
| 3. Goral. | 8. Persian Goitred Gazelle. |
| 4. Chiru. | 9. Goa Gazelle. |
| 5. Blackbuck. | 10. Nilgai. |

Tibet, is nearly allied to the Mongolian *U. caudatus*, from which it is distinguished by its lighter build, shorter tail, and the deeper tint of its fur. The upper surface of the head, together with the nasal region and the chin, is brown with a tinge of maroon; while a whitish patch, which occupies the under surface of the neck, is more prolonged under the jaw than is the case in the Mongolian species. The colour of the upper part of the body and flanks is a yellowish grey suffused with brown, the latter tint predominating along the middle line of the back, on the front of the shoulders, and on the fore-legs and thighs. The feet are less light-coloured, while the buttocks and the inner surfaces of the legs are whiter than in the species with which the comparison is made. The height at the shoulder is about 24 inches.

While there are slight differences in the form of the horns, the characters of the skull are said to afford ample means of distinguishing between this species and *U. caudatus*.

THE MISHMI TAKIN

(*Budorcas taxicolor*)

NATIVE NAME.—*Takin*, MISHMI HILLS

(PLATE V. FIGS. 1, 1a)

At the present day there are comparatively few animals coming under the designation of big game that have not fallen to the rifle of the British sportsman; but the strange-looking ruminant known to the natives of the Mishmi Hills, on the northern frontier of Assam, as the takin, appears, at any rate till recently, to have been an exception to this rule. And this seems the more strange seeing that the Mishmi Hills lie within sight of British territory; they are, however, at

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ordinary times closed to British sportsmen. It is true that the first known specimens of the takin were obtained by Brian Hodgson (who described the animal) while British Resident at Katmandu ; but these were procured by the aid of native explorers. One of them is now mounted in the British Museum. Although generally regarded as a relative of the serows, a Swiss and a German naturalist have suggested that the takin comes nearer to the musk-ox ; but the evidence at present



FIG. 24.—Skull and Horns of Adult Male Takin. From a specimen in the possession of Colonel John Biddulph.

available does not seem to confirm this view, and the muzzles of the two animals are certainly very different.

The takin is a clumsily-built animal, standing about as high as a small mule, the height at the withers being about $3\frac{1}{2}$ feet. The stout limbs have relatively large lateral hoofs ; the tail is short and goat-like ; the profile of the face is markedly convex ; and, with the exception of a small bare spot at the extremity, the muzzle is completely covered with hair. The coat, which is somewhat sparse, is formed by com-

paratively short and rather coarse hairs. Both sexes are horned, the horns of the males presenting a curious approximation in form to those of the white-tailed gnu of Africa. Black in colour, they rise close together on the forehead, and are at first directed outwards and somewhat downwards, but shortly below the middle make a more or less abrupt turn, after which they are directed upwards and backwards, sometimes in a straight line, but, in other cases, in a more or less marked curve. The longest known horns measure $24\frac{1}{2}$ inches along the front curve; one pair with these dimensions (see illustration) being in the possession of Colonel John Biddulph, and a second in the Indian Museum, Calcutta. Several examples ranging between $20\frac{1}{2}$ and $22\frac{1}{2}$ inches in length are known. Some difference of opinion has



FIG. 25.—Frontlet and Horns of Young Male Takin. From a specimen owned by Mr. A. O. Hume.

arisen with regard to the horns of the female. The late Mr. Hodgson described them as similar in form to those of the male, but smaller. But in a paper communicated to the *Proceedings of the Zoological Society* for 1887, Mr. A. O. Hume urged that this was incorrect, and that the female horns were of the type shown in our second text-figure. On this subject Captain A. Wilson, of the 14th Gurkhas, wrote as follows to the publisher, from Kohima, Assam, in March 1900: "In the last edition of your book (*Records of Big Game*) I saw the head of what was supposed to be a female takin, and as I had seen a good many heads of this animal at one time and another, I thought it strange that a female's head had never come under my notice. My regiment has just been on an expedition into

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the Mishmi country, and I gave the men instructions to get a female takin head. A good many heads were brought in, but none like the one in your figure, with the exception of very small specimens, which belonged to very young animals." The writer then goes on to say that he consulted Mr. Needham, the political officer at Sadiya, who had seen a considerable number of heads, and he was of opinion that the female horns are similar in shape to those of the male, and that the small singly-curved horns shown in the figure on page 25 are those of immature animals. The question may accordingly now be regarded as settled.

On the head the colour of the hair of the takin is black, but elsewhere it varies from yellowish to reddish brown mingled with black.

The precise limits of the geographical distribution of the typical Mishmi takin are not yet known ; and practically nothing has been hitherto ascertained with regard to its mode of life, although it has been stated to be met with both in herds and singly.

THE MOUPIN TAKIN

(*Budorcas taxicolor tibetanus*)

NATIVE NAME.—*Ye-more* IN EASTERN TIBET

The specimens on the evidence of which the Moupin race of the takin was described being in the Paris Museum of Natural History, it is impossible to institute a critical comparison between them and the examples of the typical Mishmi form in the British Museum. Consequently, it seems best to quote the description of the former given by their describer, the late Professor Milne-Edwards.

Writing of the younger examples obtained by the Abbé David, the Professor observes that at this stage of its existence the Moupin *Budorcas*

presents a considerable resemblance to a small, long-haired, and somewhat woolly calf. In colour it is brown-red, more or less dark, and passing into black along the middle line of the back, on the cheeks, the upper part of the body, and the feet. The build is less heavy than in the adult, and the horns commence to bud at an early period. With advancing age the coat lightens and becomes in great part yellowish, as in the adult, although the original brown-red colour persists for a long time in front of the withers and in the region of the pelvis. In the adult female, continues Monsieur Milne-Edwards, the colour is paler and greyer than in the bull; but none of the specimens in the Paris Museum show the coloration of the Mishmi takin. According to Hodgson, the coat of the latter is mixed with yellowish tints, as in the badger. The specimen preserved in the British Museum has the same greyish tint, and the example of which Dr. Grey has given a coloured figure is slaty, instead of the reddish-yellow tint seen in the Moupin animal.

The writer then goes on to state that if the figures of the skull published by Hodgson be exact, there are also certain differences between the horns of the Moupin and the Mishmi takin. Whether these peculiarities indicate distinct species, or local races of the same animal, the Professor considers it difficult to determine, but considers it best, with the information at present available, to regard them in the latter light.

According to the information obtained by the Abbé David from the natives, the Moupin takin frequents the steepest and most thickly-wooded declivities of its native mountains, only leaving its retreats to feed during the night. In winter, when the mountains are enveloped in snow, it ascends to the elevated tracts above the forests where no snow falls at that season, finding there an abundance of dry herbage on the slopes exposed to the sun, on which the snows that fall in the summer and autumn have been melted by the solar rays. In these districts the takin seems to be fairly common, and it ranges eastwards into the Chinese province

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of Szechuen. Although generally living solitary or in small parties, it is stated to collect during the month of June in herds of considerable size.

THE NILGAI, OR BLUE BULL

(*Boselaphus tragocamelus*)

NATIVE NAMES.—*Nil*, *Nilgao* (male), *Nilgai* (female), *Rojh*, *Roz*, OR *Rojra*, HINDUSTANI; *Ru-i*, DECCANI, MAHRATHI, GUZRATI, etc.; *Guraya* OF THE GONDS; *Murim* (male), *Susam* (female) OF THE HOKOL; *Manu-potu*, TAMIL; *Mairu*, MARAVI; *Kard-Kadrai*, CANARESE

(PLATE V. FIG. 10)

It is an unfortunate circumstance for sportsmen that the largest of Indian antelopes is so poorly off in the matter of horns that, from the point of view of trophies, it is scarcely worth powder and bullet. And this is the more remarkable from the circumstance that the animal is a near relative of the elands, kudus, and harnessed antelopes of Africa, the males of which carry large and graceful horns, while the animals themselves are among the most beautiful of their tribe. Not less remarkable is the fact that in past times eland and kudu, as testified by their fossil remains, were the companions of nilgai on the plains of Northern India; and the reason for the disappearance of the two former from the country and the survival of the latter is one of the many unsolved problems presented by zoology. As the nilgai is unknown in Ceylon, it might have been considered to be a comparatively recent immigrant into India, but since its fossil remains are found at the foot of the Himalaya, and (at a more recent epoch of the earth's history in the valley of the Narbada), while the genus is unknown in any other country, it is evidently a very old

inhabitant of the north of India, which has probably only made its way into the south of the peninsula at a comparatively recent date.

The native name nilgai properly refers only to the female, and therefore means "blue cow"; the adjective *nil* (pronounced *neel*) being again met with in "Nilgiris," and also, in a substantival form, as the general term for indigo. Sportsmen, however, more generally call the animal "blue bull," which is the translation of the Hindustani *nilgao*.

The nilgai is such a peculiar, not to say ungainly looking creature, that it cannot possibly be mistaken for any other member of the antelope tribe. Like all its African relatives, with the exception of the elands, it is only the male that bears horns. The horns are smooth, short, nearly straight, and directed upwards and backwards; the section being triangular at the base, but becoming circular near the tip. The front edge bears a distinct keel, which in old bulls extends forwards and inwards till the bases of the horns are almost in contact in the middle line. With a peculiarly long and pointed head, the nilgai has the fore-legs considerably longer than the hinder pair; and it is largely owing to this feature that the animal has such an ungainly and clumsy appearance. Although the neck is ornamented with a mane in both sexes, it is only the bulls that develop a tuft of long hair on the throat. The ears are of moderate size, and pointed; there are glands of small size below the full ox-like eyes; the narrow and delicate muzzle is naked and moist; and the tail, which reaches about to the hocks, is tufted with long hairs in its terminal half. The hair of the body is short and somewhat wiry; and it does not appear that the winter coat is appreciably longer than that of summer. Neither does there seem to be the marked change in colour between the winter and summer coats which is so conspicuous in most members of the deer tribe, so that one description will do for all seasons of the year.

The general colour of the hair of a full-grown blue bull is dark speckled grey, more or less distinctly tinged with either blue or brown;

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the mane and other tufts of long hair are, however, deep glossy black; and streaks and patches on the ears and face, a gorget on the throat, a narrow streak on each buttock, as well as a ring above and below each fetlock, together with the under surface of the body and tail, are pure white. The terminal half of the outer surface of each ear, as well as two spots in the interior of the same, are black, as are the horns. Young bulls and cows have the grey of the adult bulls replaced by brown. A large bull nilgai stands from 13 to 14 hands (4 feet 4 inches to 4 feet 8 inches) at the withers, which are unusually high, and therefore cause the animal to measure well. Average-sized horns measure about 8 inches along the curve in front, but Mr. Rowland Ward records four specimens exceeding 9 inches in length, the largest of these (in the possession of Sir E. G. Loder) measuring $9\frac{3}{8}$ inches in length and $7\frac{3}{4}$ inches in circumference. These dimensions are, however, very largely exceeded by the horns of a splendid bull killed by Mr. A. O. Hume in the Aligarh district in the year 1855. These unique horns, which were unfortunately destroyed during the Indian mutiny, measured $11\frac{3}{4}$ inches along the front curve, and $9\frac{1}{2}$ inches in basal girth.

The present range of the nilgai includes a large portion of peninsular India, from the foot of the Himalaya to the south of Mysore, in Madras, but excluding Assam, Eastern Bengal, and apparently the Malabar coast. The animal is particularly common in many parts of the Punjab, such as the neighbourhood of Jhelam, Guzerat, and the North-West and Central Provinces. In Ceylon, as already said, it is unknown, as it is in the countries to the eastward of the Bay of Bengal; it may therefore be regarded as a specially characteristic Indian animal.

Like so many of the larger representatives of the *Bovidae*, old bull nilgai generally prefer a solitary existence for the greater part of the year, although they occasionally collect in bachelor parties, which may sometimes number half-a-score individuals, or even more. The cows and

calves, as well as the younger bulls, on the other hand, associate in family parties, or, less commonly, in small herds. The cows give birth either to a single calf or twins, and apparently breed every year. Although seldom resorting to thick forest, nilgai specially affect ground covered with thin bush among which larger trees occur at intervals ; and they are equally partial to open grassy plains with patches of covert into which they can retire. Frequently, too, they may be seen feeding contentedly among the

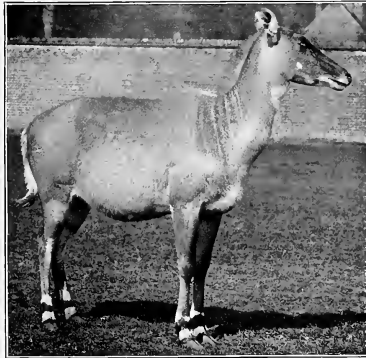


FIG. 26.—Female Nilgai at Woburn Abbey. From a photograph by the Duchess of Bedford.

corn-fields of the natives ; and this under a burning noonday sun, since the nilgai is an animal of diurnal habits, although sometimes resorting to the shade for a short *siesta*. In some districts, where they are in the habit of resorting frequently to the corn-fields for their daily meal, they display remarkable unconcern at the presence of man. This is largely due to the fact that, as its name implies, the nilgai is regarded by the Hindus as a near relation of the sacred cow, and consequently enjoys more or less complete immunity from molestation. In deference to these prejudices, the shooting of these animals by Europeans is even prohibited in certain

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districts. In spite, however, of its semi-sacred character, the flesh of the nilgai is eaten by most of the Hindus of the Deccan, not even excepting those jungle-tribes who regard the gaur in the light of a deity.

On account of the insignificant nature of the trophies it yields to the sportsman, the bull nilgai is not regarded as worthy game for the rifle in most parts of India. Its beef may, however, be useful on occasions to supply a large camp with food, the marrow-bones being a delicacy, and the tongue of good quality. The skin, too, makes excellent leather, the thinner portions of the hide becoming as soft and pliable as sambar-leather, while the thicker skin of the back is suitable for sole-leather.

A writer in *The Asian* newspaper of 21st February 1899 relates the following experiences of nilgai-stalking :—"I have frequently found blue bull wild and difficult to approach, requiring a careful stalk to enable one to obtain even a long shot. The first one I saw and killed looked so like the village oxen in whose proximity it was grazing that I had some compunction in shooting it, whilst my companion entirely mistook it for a domestic cow, and thus permitted it to retreat and meet its fate in my direction. My first shot broke the animal's fore-leg, and it was brought to bay after a short chase through the bushes by my little fox-terrier, and finished off with another bullet. The next that fell to my rifle was a large, almost black bull, that got up out of a nala close to me in thick jungle, and was immediately shot, for we were in want of meat. I then discovered that the unfortunate creature had a number of dreadful wounds on its back, evidently inflicted by a tiger some time previously ; and it was in such an emaciated condition that the flesh did not appear to me to be fit for food, although it was eagerly devoured by the jungle-men who were with me."

The same writer then goes on to refer to the extraordinary tenacity of life displayed by nilgai when wounded. "I have frequently," he writes, "experienced considerable difficulty in killing them, and have known one

travel far with a heavy and well-placed bullet in the shoulder, which would have been sufficient to kill most animals. On another occasion a sportsman with me shot one of these beasts and proceeded to cut its throat. When the operation had been partially performed, the animal suddenly jumped up and ran some distance, but did not attempt to attack its rash assailant. The blue bull was shot through the lungs, and the release of the blood at the throat had relieved the pressure on the chest, and so enabled the animal to recover for a space." It is added that in the district referred to almost every nilgai killed had one or more bullets, presumably fired by natives, embedded in its body. And when the amount of damage these animals, in districts where they are numerous, inflict on the crops of the cultivators of the soil is borne in mind, it is little wonder that, when religious prejudices do not interfere, war to the death is waged against them.

But man is by no means the only enemy against whom the nilgai has to be on its guard. Tigers, as in the instance quoted above, wound or kill a large number, even of full-grown bulls, while the younger members of the herd fall victims to the stealthy advance of the leopard. Wild dogs, too, probably capture a certain number, especially as they are more easy to run down than are sambar and other large deer.

It must not, however, be inferred from the last statement that the nilgai is by any means a slow mover. Quite the contrary: and when they are found in country of a sufficient open nature to admit of their being ridden down and speared, the heavy gallop of even an old bull will call forth the best efforts of a good horse, while on hard ground it is more than probable that a cow in prime condition would get clean away from her pursuer. However lightly esteemed at the present day, nilgai-hunting (probably on horseback) was a favourite sport of the ancient Mogul emperors of India; and, as we learn from Bernier's account, it was practised by Aurungzeb on his biannual progress between Delhi and Kashmir. At that date the

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animals are stated to have been extraordinarily abundant in certain parts of the country.

Although old bulls can never be depended upon, and are always apt to make themselves disagreeable, nilgai, if captured at a sufficiently early age, can be readily tamed and broken to harness; and if it were worth while, and the animals were sufficiently abundant, there is little doubt that they would make as useful beasts of burden and draught as the reindeer.

Like most ruminants which inhabit open and sandy districts, nilgai can exist with but a small supply of water; and it is probable that, in the cold season at least, they drink only every second or third day, and, at a pinch, could go for a considerably longer period without liquid.

Nilgai were first exhibited alive in England in 1767, when a pair were sent from Bombay as a present to Lord Clive; a second pair being shortly afterwards presented to the then queen. In 1862 Signor Comba introduced a dozen nilgai into his park at Mandria, Italy; and ten years later the herd had increased to 172 head, which roamed at complete liberty over the domain. A small herd are now kept by the Duke of Bedford in the open park at Woburn Abbey.

THE FOUR-HORNED ANTELOPE

(Tetraceros quadricornis)

NATIVE NAMES.—*Chousingha*, *Chouka*, *Doda*, HINDUSTANI; *Bhokra*, *Phokra*, GUJRATI; *Bhirki* AT SANGOR; *Bhir* OF THE GONDS; *Bhirul* OF THE BHILS; *Kotari* AT CHUTIA NAGPUR; *Kurus* OF THE GONDS OF BASTAR; *Kouda-gori*, TELEGU; *Kondguri*, *Kaulla-Kuri*, CANARESE; *Jangli-bakri* IN THE DECCAN

(PLATE V. FIG. 6)

It is not a little remarkable that while among all the numerous varieties of the antelope tribe inhabiting Africa not a single species has developed more than the ordinary pair of horns, yet that among the few representatives of the group found in India there should be one with two pairs of these appendages. But it is still more remarkable that the only other known wild four-horned ruminant in the world is, or rather was (for it is extinct, and only known by its fossilised remains) also an inhabitant of India. The latter animal is the *Siwatherium*, whose skull was discovered many years ago in the Siwalik Hills of Northern India, and which is by far the largest of all known ruminants, as the four-horned antelope is one of the smallest. It was at one time thought that these two singular ruminants were near relatives, but later researches do not countenance this idea; and the reader may consequently invent any theory that pleases him best to account for the independent development of this redundancy of horns.

It would be only natural to expect that the existence of the extra pair of horns in the present species would be indicated in some at least of its native names. And this is really the case, the name *chousingha* (*cha*, or

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chou, four, and *singh*, a horn) being the Hindi equivalent of four-horned antelope. In this connection it is noteworthy that in the Deccan, and apparently most parts of the Madras Presidency, where the front pair of horns are frequently, if not invariably absent, that the animal is known simply as *jangli bakri*, or wild goat. By sportsmen it is frequently termed the *chinkara*, a name properly belonging to the Indian gazelle.

Even when the front pair of horns, which are situated between the eyes of the bucks (the does being altogether hornless), are fully developed, they are but poor affairs; being frequently little more than black horny knobs, and even at their best they are not known, with one exception, to exceed $2\frac{1}{2}$ inches in length. Neither are the back horns, which are simple pointed spikes, much to boast of in the way of size, the maximum recorded length being 5 inches. As a rule, the length of the front horns seldom exceeds a little more than half that of the hinder pair, but in the exception alluded to above the front pair ($3\frac{3}{4}$ inches) slightly exceed the hinder ones ($3\frac{1}{2}$ inches) in length. This remarkable specimen, which was obtained at Mandla, in the Central Provinces, is in the possession of Captain B. H. Boucher.

Although, as already said, the horns of this pretty little antelope are always comparatively small, the presence of two pairs renders the heads much sought after by sportsmen as trophies. In the Madras Presidency the front pair of horns are, however, said to be but seldom developed; and if it were to turn out that in certain districts they were invariably absent, and as regularly present, in individuals from other parts of India, then the two-horned form would be entitled to rank as a distinct local race, or subspecies. But if that were proved to be the case, the creature would have to be known as *Tetraceros quadricornis sub-quadricornutus*; and it is therefore to be earnestly hoped that no such distinction may be found practicable. Kathiawar specimens have likewise frequently but one pair of horns.

The chousingha is the Indian representative of the duikers of Africa ; its affinities to the latter being indicated, among other features, by the circumstance that the face-gland takes the form of a narrow deep slit on the side of the face below the eye, that of the duikers forming a narrow bare line perforated at intervals by pores. The muzzle of this antelope is bare and moist, the tail is short, and the female has three teats. In size and build it may be compared to a small gazelle, the height at the shoulder being about 25 inches, and the weight about 40 pounds. The general colour of the short and stiff hair may be described as dull rufous brown, becoming whitish beneath, with the muzzle, the outer surface of the ears, and a line down the front of each leg blackish brown, and some white on the outer side of the pasterns. The doe may be readily distinguished from a female of the Indian gazelle by the absence of the face-markings which form such a characteristic feature of the latter. More difficulty may perhaps be experienced in distinguishing between a doe chousingha and a female hog-deer, but the two can always be separated by the absence in the former of gland-tufts on the hind-legs.

The four-horned antelope is an exclusively Indian antelope, occurring locally over a great portion of the peninsula, from the foot of the Himalaya southwards. It is unknown both in Ceylon and to the eastward of the Bay of Bengal ; and here it may be remarked that this is true of all the four species of Indian antelopes, namely the nilgai, the chousingha, the blackbuck, and the chinkara. Probably the Burmese countries, from the excessive moisture of their climate, are totally unsuited to antelopes of this type, which prefer dry, open districts, but whether the same explanation will account for their absence from Ceylon is not so easy to say.

As regards its distribution in India, it appears that the chousingha is to some extent a local animal, being unknown on the plains of the Ganges, and likewise on the Malabar coast of Madras. It has been reported from

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Sind, and there are skulls in the British Museum from Kathiawar. In the wooded districts of Rajputana it occurs abundantly, and it is equally common in the Bombay Presidency, as well as in the Central Provinces and the northern districts of Madras. Towards the east, in Chattisgarh, Chutia Nagpur, and Orissa, it becomes decidedly more rare, as it does to the southward in Mysore, where it is only occasionally met with. It has also been observed on the Nilgiri and the Palni Hills of south-western Madras. Along the foot of the Himalaya it occurs, in suitable districts, from the Punjab in the north-west to Nepal in the south-east.

The favourite haunts of this little antelope are districts where the ground is hilly and wooded, but not encumbered with thick jungle: a country, in fact, similar to that met with between Rawal Pindi and Muree, after the plains are left. Unlike the blackbuck, it is not fond of company, and it is but seldom that more than two or three are seen together, while it is frequently solitary. In these unsocial habits it agrees with its African relatives the duikers, as it does in its partiality for covert. In constantly keeping in the neighbourhood of water, and in drinking regularly once a day, it differs, however, from the common duiker, which, as stated in the *Great and Small Game of Africa* (p. 233), is frequently met with far from access to water. But in this respect the Natal duiker comes nearer to the chousingha, since, according to Mr. Vaughan Kirby in the work cited, that species drinks once daily in the cold season and twice during the hot weather. The pairing-season of the chousingha takes place during the summer rains, the young making their first appearance in the world during the following January or February, so that the period of gestation may be set down at about six months. From their excessive shyness these antelopes are always difficult to approach; when put up, they start off with a peculiar jerky run, which can never be mistaken, and this jerkiness characterises also their walk. The fawns are either one or two in number, and if taken at a sufficiently early age are easily

tamed and make delightful pets, as do those of the common duiker. Here it may be remarked as a somewhat curious circumstance that among ruminants there appears to be no relation between the number of the teats and that of the young produced at a birth. Indeed cows and sheep exhibit an inverse proportion in this respect, the former, which have four teats, very rarely producing more than one calf at a birth, whereas among the latter, in which there are but two teats, twins are common. This difference may, however, probably be explained by the difference in the size of the two animals, large species producing a smaller number of young than their smaller relatives. With the exception of the Chinese water-deer, no ruminant produces more than a pair of young at a time save as a rare abnormality.

Most hunters say that the flesh of the chousingha is dry and tasteless, although it may be improved by being well larded with mutton fat. Mr. Blanford, however, speaks of it in a more favourable manner, although admitting that it is far inferior to that of the chinkara or the blackbuck.

THE BLACKBUCK

(Antilope cervicapra)

NATIVE NAMES.—*Ena* (male), *Harina* and *Mirga*, SANSKRIT; *Haran* or *Harna* (male), *Harni* (female), *Kakwit* (female) and *Mrig*, HINDUSTANI; *Kala* (male), *Goria* (female), IN TIRHOOT; *Kalsar* (male), *Baoti* (female), IN BEHAR; *Bureta* IN BHAGALPUR; *Barant* and *Sasin*, NEPALESE; *Alali* (male), *Gandoli* (female), BAORI; *Badu*, HO KOL; *Bamani-haran*, URIA AND MAHRATHI; *Phandayat*, MAHRATHI; *Kutsar*, KORKU; *Veli-man*, TAMIL; *Irri* (male), *Ledi*, AND *Jinkar*, TELEGU; *Chigri* AND *Huk-lara*, CANARESE

(PLATE V. FIG. 5)

Although now in such familiar use as to be practically an English word, the term antelope appears originally to have been employed to denote a fabulous or semi-fabulous animal, Eustathius, in the fourth century of our era, alluding by this name to an imaginary creature dwelling on the banks of the Euphrates, which was reported to entangle itself in bushes with its horns, and to saw down trees with the same weapons. As to the origin of the name there is some degree of doubt, but it has been suggested that it is a derivation from *Pantholops*, the old Coptic title of the unicorn.

Whatever may be its true derivation and origin, it is certain that by the early English writers and subsequently by the great French naturalist Buffon the name antelope was applied to the present beautiful species; and although, both in its original form and as the Latinised *Antilope*, the term was subsequently extended to include all the ruminants still commonly known as antelopes, yet it is to the Indian blackbuck that it properly

belongs, and it is to that species alone that the scientific term *Antelope* is now restricted. Properly, therefore, the blackbuck ought to be known as *the* antelope, pure and simple ; but according to present usage, if used at all, the latter name must be qualified by the prefix Indian.

Although so common, the blackbuck is one of the most graceful of all the antelopes ; and its elegant, spirally-twisted black horns have long been in use in the courts of Indian rajas as handles to the *chaoris*, or yak-tail fly-whisks. It is one of the few antelopes in which the male differs markedly from the female in colour, the others being certain species of the bushbucks and kobs of Africa. The black colour assumed by the old males of this species is indeed what naturalists call a specialised feature, fawn being the original colour of all the antelopes of the present group. In addition to being the sole representative of the genus *Antelope* (in its modern restricted sense), the blackbuck is likewise the type of a large group or sub-family of antelopes which includes, among others, the saiga of the Russian steppes, the Tibetan chiru, the widely-spread gazelles, and the African springbuck and impala. All the members of the group are small or medium-sized antelopes, generally of graceful and slender build, always with narrow, hairy, sheep-like muzzles, usually with more or less short tails, and invariably with narrow and high-crowned upper cheek-teeth resembling those of sheep. With the exception of the majority of the gazelles and the springbuck, horns are normally developed in the bucks alone. From the gazelles, with which alone it could be confused in India (as indeed from all the other representatives of the group), the blackbuck is sharply differentiated by the beautiful spiral horns of the bucks and the sable coat assumed by the fully adult members of that sex. Very characteristic, too, is the large size of the face-glands, which open by a linear slit, and during the rutting-season are constantly everted by the old bucks. Glands are likewise present in all the feet, as also in the groin ; and the does, as in all the members of the group, have but a single

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pair of teats. The hoofs are delicate and sharply pointed, and the knees are furnished with tufts or brushes of stiff hairs.

In height the blackbuck stands about 32 inches, and its average weight is about 85 pounds. The long and slender corkscrew-like horns of the bucks, which arise near together on the forehead, are cylindrical and divergent, but display great individual variation in the degree of divergence. Their spiral is, however, always comparatively close; and their ridges, or rings, which completely encircle the horn, extend from the base (where they are more approximated than elsewhere) nearly to the tip. Usually the number of turns in the spiral is from three to four, but five is by no means uncommon, and in the unique example shown in the accompanying figure the number reaches six. In this specimen, which belongs to Mr. A. O. Hume and was obtained in the Delhi district, the extreme length, measured in a straight line, is $28\frac{1}{4}$ inches, and the interval between the tips $17\frac{3}{4}$ inches. The former dimension is only known to be exceeded in the case of a specimen once in the possession of General Sir Bindon Blood, in which the length is stated to be half-an-inch more. In horns of over 20 inches in length the interval between the tips varies from a minimum of $13\frac{1}{2}$ to a maximum of $24\frac{1}{2}$ inches. Throughout the greater part of the Indian peninsula blackbuck horns rarely exceed 22 inches in length, from 16 to 20 inches being a fair measurement for good average specimens. Rajputana and Hurriana are the districts where the longest horns are generally met with. In rare instances does develop horns, which are somewhat irregular in shape, and generally curve to a greater or less degree backwards.

In the does of all ages and in the younger bucks the colour of the head, upper-parts of the body, and outer sides of the limbs is yellowish fawn, while the under-parts are white; a pale band runs in the fawn a short distance above the sharp line of division from the white. In old bucks the colour of the upper-parts is blackish brown, passing

almost into black in very aged individuals; the nape of the neck is, however, always brownish rufous, and the front and sides of the neck, as well as the face, with the exception of an irregular white patch round each eye, are blackish brown. With the acquisition of the black coat,



FIG. 27.—Skull and Horns of Male Blackbuck from Delhi. In the possession of Mr. A. O. Hume.

the light lateral streak disappears from the flanks of old bucks. Information is still required as to the precise age at which the bucks begin to acquire their sable dress. A mounted specimen from Madras in the British Museum, which, judging from the horns, appears to be a

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fully adult buck, exhibits scarcely any trace of blackness, and the present writer has been informed that such a condition is very common in the southern districts of India. Colonel Heber Percy states, however, in the *Badminton Library* that many full-grown bucks with good heads in all parts of India never seem to turn black at all, although the master buck of a herd is always so at the proper season. He adds, on the authority of Major FitzHerbert, that the master buck, with the change of coat that takes place after the rutting-season in the spring, turns brown, regaining his full sable hue at the close of the rains. While he is in the brown dress he resigns the charge of the herd to a younger buck, who remains black. Other observers think that all the bucks become more or less brown during the hot weather; but the whole subject of the change of colour in the bucks requires careful reinvestigation.

The blackbuck is exclusively an Indian animal, occurring locally from the foot of the Himalaya to the neighbourhood of Cape Comorin, but not crossing the Palk Strait into Ceylon. In a transverse direction its range extends from the Punjab to Lower Assam, while its southernmost limit appears to be Point Calimere; it is unknown on the Malabar coast to the south of the neighbourhood of Surat, as it is in the swamps of the Ganges delta, which are totally unsuited to its habits. It is, however, not absolutely unknown in Lower Bengal, since it frequents the plains in the neighbourhood of the coast in Midnapore, as it does those of Orissa. The Jhelam and the rivers which join it to flow into the Indus appear to form the northern boundary of the Indian antelope in the Punjab. The species is most abundant in the North-West Provinces, and on the confines of the Indian desert between Rajputana and the Punjab, where, as already mentioned, it grows longer and finer horns than in the south; but even in these districts it is but locally and apparently capriciously distributed, being

unknown in many places apparently in every way suited to its habits. The Mattra district and the neighbourhood of Meerut are well-known centres for buck-shooting.

The blackbuck, although often found in the *churs*, or islands covered with long grass in the river-valleys, as well as on the banks of the latter, is essentially an inhabitant of the open plains, invariably avoiding both hilly and forest-clad districts. No other Indian ruminant occurs in such extensive herds, and although it is somewhat difficult to credit the statement by Jerdon that in the Hissar district the numbers in a herd were estimated at between 8000 and 10,000, yet there is no doubt that in the old days these were very large indeed. More commonly, however, the herds consist of from about ten to thirty, or even fifty does, attended by a single master buck, who does not by any means remain constantly with his charges. The pairing-season takes place in the spring, in February or March, the time varying somewhat according to locality. The young may be either one or two in number, and as they may be seen of all ages at all seasons, it would almost seem as though the period of gestation were not constant, although this is very unlikely. Not unfrequently during the pairing-season the master buck will separate a particular doe as his special companion, and not allow her to rejoin the herd till the period is over. The young fawns are frequently concealed by their dams among grass or bushes, after the manner of deer, and occasionally the adults, especially if wounded, will resort to the same kind of covert.

The short grass which partially covers so much of the plains of India, as well as various kinds of cereal crops, afford the chief food-supply of the Indian antelope, grazing taking place at all hours of the day, although the herd frequently enjoys a period of repose during the hottest time. Whether it ever drinks is a matter on which there may be some difference of opinion among observers, but that it can exist

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perfectly well without taking liquid food is demonstrated by the existence of a herd on a narrow spit of land between the Chilka Salt-Lake in Orissa and the sea, where, for a distance of thirty miles, the only fresh water obtainable is derived from wells.

When a herd of blackbuck are frightened and start off to escape from intruders, they invariably take a number of leaps high in the air, after the manner of springbuck, and this is observable even in the herd at Woburn Abbey, when they start to run across their large paddock at the call of their keeper. After continuing their gambols for a few hundred yards or so, the members of the herd settle down into a gallop, the speed of which, except under special conditions, generally ensures their escape even from the swiftest greyhounds. Occasionally, however, blackbuck have been pulled down by greyhounds on ordinary ground; and on heavy sand, as in parts of Orissa and the Punjab, as well as on the soft rich pastures of Point Calimere, to the south of Trichinopoli, they can be taken by dogs with no very great difficulty, as they also can in other districts when the ground is soft and holding after heavy rains. Blackbuck have, too, occasionally been speared by riding them down, but it requires a horse with a great turn of speed and power of endurance to effect this; and an ordinary horse frequently has considerable difficulty in overtaking a wounded buck. The flesh of this antelope is of good quality, although inferior to that of the chinkara.

If captured young the blackbuck can be easily tamed, but the old males are always apt to become spiteful, especially during the pairing-season. During this season they walk about with a peculiar mincing gait, the head being thrown back so that the horns lie on the back, and the face-glands widely opened. At this time the buck frequently utters his peculiar short grunt, the only other sound the species produces being a hissing by the does. When in the state of excitement referred

to above, the old bucks are dangerous both to human beings and to other animals in their neighbourhood. On this account it was found advisable to get rid of the old male belonging to a small herd kept at Woburn Abbey, where these beautiful antelopes have thriven well.

In its wild state the wariness of the species varies in different districts according to the amount of disturbance to which the herds are subjected. In districts where there is but little shooting the herds may often be approached within a hundred and fifty yards or even less ; while they will frequently allow natives with their carts or oxen, on their way to and from ploughing, to come comparatively close. Natives, indeed, are always allowed to approach much nearer than are Europeans, and sportsmen sometimes don the native dress in order to get more easily within range. Solitary master bucks are always more difficult to approach than those with the herds, and to stalk such successfully demands all the skill and ingenuity of the sportsman. When engaged in combat with each other for possession of the does, the old bucks are much less wary than usual. In stalking a herd, the plan usually recommended is to walk round in a semicircle, gradually closing in, and taking only side glances at the quarry, till within range, when the shot should be immediately delivered standing. If two sportsmen are working together, from opposite sides of the herd, the stalk is rendered much easier. On the approach of an intruder, some of the does will often begin to leap into the air, but this by no means necessarily implies that the herd is about to seek safety in flight. A horse, led by a native groom, or *sais*, which can be ridden to within stalking distance, will frequently be found an invaluable auxiliary in buck-shooting.

The natives of India have many—for the most part unsportsmanlike—ways of capturing the blackbuck. The most celebrated is the capture by trained hunting-leopards, or *chitas*, which are taken out blindfold in a cart, and slipped at their quarry when the vehicle has approached as close as

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practicable. The hunting-leopard either secures his prey by a single rush (the speed of which is described as almost incredible), or, if he fail in this, gives up the pursuit in disgust. Another method is to place a number of snares at intervals over a considerable area of ground, and then to drive the herd across it, when, of course, animals of all ages and both sexes are taken. A less common plan is to send a number of tame bucks, upon whose horns snares are tied, into the herd, when the master buck challenges the intruders, and during the fight that ensues is frequently caught himself.

Colonel Heber Percy describes a method of stalking by means of a small grass screen and a tame buck and doe held in check by a long string. When the sportsman and his attendant come within a convenient distance of the herd, they set up the movable screen, which is furnished with a hole through which the muzzle of the rifle can be thrust, and take up their position behind it, crouching down on their knees. Meanwhile the decoy buck and doe are incited to walk out in front of the screen, and soon attract the attention of the master buck of the herd, who advances to challenge the intruding rival and carry off the doe. He is, however, somewhat curious and anxious with regard to the screen, and endeavours by a flanking movement to ascertain what is concealed behind it. To obviate this the screen must be constantly shifted round in accordance with the movements of the buck, till he comes sufficiently near to afford a shot. It is said that the decoy buck should not be too old, or the herd-buck may be afraid to challenge him.

In neither of the three well-known manuals of Indian mammals is there any mention of a white blackbuck. A milk-white specimen is, however, preserved in the Hon. Walter Rothschild's museum at Tring Park. If not absolutely unique, this specimen must apparently be a great rarity.

THE CHIRU, OR TIBETAN ANTELOPE

*(Pantholops hodgsoni)*NATIVE NAMES.—*Tsus* (male), *Chus* (female), *Chiru* AND *Chuhu*, TIBETAN

(PLATE V. FIG. 4)

Most fabulous animals appear to have a living prototype, and there seems to be a considerable degree of probability that the present species may be the one to which the legend of the unicorn owes its origin. At any rate this was the opinion of Brian Hodgson, to whom we are indebted for first making known the chiru, and who gave it the name of *Pantholops*, as being an ancient title of the unicorn. There has long been a tradition to the effect that the unicorn came from Tibet, and the long slender horns of the chiru, if seen in profile, might well give rise to the idea of a unicorned animal. It is, however, distinctly remarkable that in Tibet itself there exists a belief in the existence of a unicorn, even in districts where the chiru itself is a familiar animal. Possibly, as General Macintyre suggests in his book, *The Hindu Koh*, the legend may be based on a chiru that had lost one of its horns.

Whatever may be its relation to the fabled unicorn, the chiru is a very interesting and peculiar member of the great tribe of antelopes. As is shown by the structure of its skull and teeth, it evidently belongs to the same group as the blackbuck and the gazelles, although its nearest relative appears to be the saiga of the Russian steppes. A male chiru stands from about 31 to 33 inches at the shoulder, and is distinguishable at a glance from all other antelopes by his long, erect, slightly curved, and subulate black horns, curiously puffy nose, hairy muzzle, thick coat of soft and almost woolly hair, and short bushy tail. The puffiness of the nose is due

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to a protuberance situated by the side of each nostril, which marks the position of a large lateral chamber, or sac, in the latter, this being very probably designed, in some unknown manner, to assist respiration at high altitudes. Another peculiarity of the chiru is to be found in the great development of the inguinal glands, which it possesses in common with other ruminants, these forming tubes, running up a considerable distance into the body. Large glands are likewise present between the hoofs of both the fore and the hind feet, but there are no glands on the face below the eyes. The horns of the bucks, which arise close together on the skull a short distance above the eyes, and are remarkable for their fine grain, are much compressed from side to side, and carry a large number of bold transverse ridges on the front surface for the greater part of their length, but are quite smooth behind; their general shape has been already mentioned, but it may be added that they curve slightly forwards at the tips. Chiru horns are remarkable for the constancy in their size and shape; the largest pair on record are the property of Mr. A. O. Hume, and measure $27\frac{3}{4}$ inches in length along the curve, with a basal circumference of $6\frac{1}{8}$ inches. Several specimens closely approaching these dimensions are known.

The coat is so thick and upright as to feel almost like the wool of a Leicester sheep, and must form a most efficient protection against the terrible winter cold of the elevated regions to which the animal is restricted. There is some considerable degree of variation in the colouring of the bucks. In a specimen, probably from Ladak, figured by Mr. Blanford in the *Zoology of the Second Yarkand Expedition*, the whole of the upper-parts and outer sides of the limbs are pale fawn colour (light rufous brown), the under surface of the head and neck being greyish white, and the inner surfaces of the ears, a streak down each buttock, the belly, and the hinder half of the inner surface of the upper portions of the limbs white. The whole of the face below the horns, and the front surfaces of

both fore and hind limbs are dark brown or black. On the other hand, in a mounted buck from the north of Sikhim, exhibited in the British Museum, the fawn colour only occupies the middle of the back, the parts in front and behind this being dirty white; on the fore-limb the black band commences on the side of the chest, and extends on to part of the outer side of the leg, while in the hind-leg the whole of the outer surface, as well as the front, is black. In both these specimens the black is continuous over the whole of the face; but in the head from Chang-chenmo figured in Kinloch's *Large Game Shooting in Tibet, etc.*, the black is patchy, and does not extend continuously over the whole face, the same condition obtaining in a head from the same locality presented by Mr. Walter Rothschild to the British Museum. About the same amount of black is noticeable on the face of a buck shot in Ladak by Mr. Powell-Cotton and mounted by Mr. Rowland Ward in 1899, but the dark stripe on the fore-leg is much narrower than usual, is partially interrupted, and stops short at the upper pastern, instead of descending to the hoof, and in the hind-leg the dark markings are altogether wanting. Since there is no evidence that these variations are local peculiarities, they must, for the present at any rate, be regarded as merely individual. They are nevertheless decidedly noteworthy.

Although General A. A. Kinloch, who was one of the first sportsmen to describe the Chiru in its native haunts, states that the females have short horns, other observers have shown that this sex is hornless, this being confirmed by a skull in the British Museum. The does, which have two teats, likewise lack the black markings of the bucks, as is clearly stated by General Macintyre in his *Hindu Koh*.

The dried skull of a chiru is remarkable and unmistakable on account of the great relative size of the aperture and cavity of the nose.

Although the chiru was first made known to science as long ago as 1826, and was more fully described by Brian Hodgson eight years later, it

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was comparatively little known to sportsmen before the appearance of General Kinloch's book on big game shooting in 1869. It is there stated that although horns of this antelope had been previously brought down by traders to the hill-stations of Naini Tal and Darjiling, it was not till some few years before 1869 that the animal had been killed by an English sportsman. The fortunate individual appears to have been the late Mr. Wilson, of Mussorie, a well-known "Shikari," who shot chiru on the Chang-chenmo river, in North-Eastern Ladak. Since that time Chang-chenmo has become a favourite hunting-ground for this handsome antelope, and it has also been killed farther eastwards, in the neighbourhood of the Manasarowar Lake, and elsewhere.

The chiru is exclusively confined to the arid districts of Tibet lying beyond the snowy range of the Himalaya, but its exact limits are not yet fully ascertained. Eastwards, it extends into North-Eastern Ladak, and it has been obtained in Hundes, across the Niti Pass, as well as in Northern Tibet. Probably, indeed, it inhabits the whole of the Tibetan plateau. From 13,000 to 18,000 feet are the elevations at which it is commonly found in Ladak, but at times it doubtless ascends to still higher elevations. It is not unfrequently called the snow antelope, but this is by no means a satisfactory name, as the greater part of the country in which it is found is free from snow in summer, and does not receive a very great amount even in winter. In Ladak very favourite haunts of the chiru in summer are the grassy flats bordering the plains of the Chang-chenmo river, and it was here that the present writer made his acquaintance with the species. The antelope used to come down to graze on this plain at early dawn, where the absence of any kind of cover, and their own extreme wariness, made them exceedingly difficult to stalk. They are, however, also to be found in other parts of the Chang-chenmo valley, where deep ravines lead from the higher grounds to the river valley. And on one occasion a chiru leapt up from one of these ravines and stood for some time gazing in

amazement at the writer and his party—and this, too, at a time when the only rifle available had a cartridge-case jammed in the barrel !

At the time of his visit the present writer used to see only some half-dozen chiru on the plain at once, but cannot recollect whether there were any females among them. General Kinloch states, however, that at the date of his trips to Chang-chenmo does were hardly ever seen there, and that although he met with herds of from sixty to seventy bucks, he on only one occasion recognised a doe among them, and this in three visits. On the other hand, Mr. Darrah, in his *Sport in the Highlands of Kashmir*, mentions on one occasion having seen a party comprising three does and two bucks in Chang-chenmo ; and General Macintyre likewise tells of having seen mixed herds. Probably, owing to the reluctance of sportsmen to shoot them, specimens of female chiru are very rare in natural history collections. The British Museum has one female skull, presented by Colonel J. Biddulph.

The preceding observations as to the difficulty of getting within range of the chiru when on the Chang-chenmo flats are confirmed by General Kinloch, who states that he frequently found it a good plan to drive them. The banks above these flats are very steep, and as it is only in certain places that the chiru can ascend them, if the sportsman places himself in the most favourable of these paths, and sends a native to drive the game towards him, he will stand a good chance of getting a shot, when it would be impossible by stalking.

July and August are the best months for shooting in Chang-chenmo, as the river-flats are then free from snow and carry an abundant crop of grass, to which the chiru descend for grazing in the mornings and evenings. In the early part of the summer, according to the observations of the last-named sportsman, the chiru apparently frequent the higher and more exposed plains and slopes, on which the snow cannot lie. As the snow which has accumulated during the winter on the river-flats melts, the antelopes gradually descend. At no time of the year do they frequent

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precipitous ground. After their morning feed on the flats in summer, they seek higher and more exposed situations in which to pass the day until it is time to descend again for the evening meal. When reposing for the day, they are reported to excavate deep hollows in the stony ground, in which they lie with only their heads and horns exposed to view.

Like all Tibetan animals, chiru appear to depend as much on sight as on smell to warn them of the approach of enemies. According to Brian Hodgson, who seems to have derived his information from native reports, chiru pair in winter, and the does give birth to their fawns (of which there is but one at a time) in the summer. In summer they are much troubled with bots, and at this season their skins are extremely difficult to preserve in good condition. The Ladakis, who, like most uneducated people, endeavour to find a reason for every peculiarity of structure they do not understand, have a theory that, when pursued, the chiru inflate their inguinal glands with air, and are thus enabled to increase their speed! General Macintyre describes the flesh of these antelopes as tender and juicy.

The chiru has never been exhibited alive in England, or, so far as the author is aware, anywhere else. Indeed, it is very doubtful if it would survive transport to the plains of India. The British Museum possesses a fine series of male skulls and horns—many of them presented by Mr. A. O. Hume; and it has likewise a mounted buck, collected by Mr. Mandelli to the north of Sikkim, and presented by Mr. W. T. Blanford.

THE GOA, OR TIBETAN GAZELLE

*(Gazella picticaudata)*NATIVE NAMES.—*Goa* OR *Ragao*, TIBETAN

(PLATE V. FIG. 9)

Of the three species of gazelle found within the limits of the area treated of in this book (and the writer presumes that all his readers are sufficiently acquainted with the appearance of a gazelle to recognise one of these animals when they see it), one has horns in both sexes, while in the other two the females are hornless. The *goa* is one of the two latter, and is specially distinguished by a white disk on the buttocks, surrounding the tail, and the peculiar and sharp backward curvature of the horns of the bucks, which are not distinctly hooked at the tip, and have somewhat the shape of a native Indian scimitar, or *takwar*. Another peculiarity of the *goa*, which is, however, shared by its larger relative the Mongolian gazelle, is the absence of the dark and light streaks which run down the face of the great majority of the members of the genus. The tail and ears, as compared with those of the more typical gazelles, are also remarkable for their shortness. Yet another peculiarity is to be found in the absence of the usual face-glands below the eyes, the places of these being indicated by naked spaces on the face. The tufts of long hairs at the knees, commonly known as knee-brushes, which are present in so many gazelles, are likewise wanting in the *goa*. In winter the hair becomes very long and soft, attaining an especial length at the corners of the mouth; but the summer coat is much shorter. The horns of the bucks, which are deep black in colour, have the transverse ridges less strongly marked but more crowded together than in any of

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the other Asiatic gazelles, their number reaching to between twenty-five and thirty in old individuals. Fourteen and a half inches is the longest length recorded for goa horns by Mr. Rowland Ward,¹ these measurements being taken from a pair belonging to the Hon. Walter Rothschild obtained from Hanle, in Spiti. These horns are an inch longer than any pair in the same list, but there are numerous examples ranging between 13 and 13½ inches in length.

A full-grown buck goa will stand from 24 to 25 inches at the shoulder. In winter the colour of the hair on the head and back is light sandy fawn, with a grizzly tinge due to the pale tips of the hairs; the summer coat has a more distinctly grey tint. The under-parts of the body are white, with the line of division from the fawn of the back not very strongly marked; on the buttocks the white area forms a large patch, including the tail, and round this caudal disk the fawn of the back assumes a more rufous tint than it has elsewhere. The tip of the tail is dark rufous brown or black; and it was from this feature that Brian Hodgson, its describer, gave to the goa the name *picticaudata*.

The goa, which General Kinloch unfortunately called the Tibetan ravine deer, has much the same geographical distribution as the chiru, being restricted to the Tibetan plateau, where it is commonly met with at elevations between 13,000 and 18,000 feet above the sea-level. It likewise frequents much the same kind of ground as the latter, avoiding rocky and steep localities, and selecting undulating plains and gently sloping valleys. Although the present writer has been in the country where these gazelles occur, he had never the good fortune to come across them, and the following account of their habits is consequently taken from other writers. In the early part of the summer they are to be found in small herds, which apparently include animals of both sexes and of all ages; but by September, and probably somewhat earlier, the

¹ Mr. Blanford gives 15.75 inches as the maximum length.

old bucks separate themselves from the herds, and go about in small parties of from two to four or five head. Although frequently difficult to approach, goa are unlike many of the Himalayan ruminants in that, when they are fired at, they do not go straight away, but, after running for a certain distance, stop and begin to feed again, thus affording the sportsman at least a second chance. When running off, the white hairs of the rump-patch are partially erected and expanded, in the same manner as in the little Japanese deer; the white patch probably in both cases serving as a guide for the hinder members of a herd to follow their leaders while in flight. The grey colour of the summer coat renders the animal much more difficult to detect than when they are in the winter coat; and is probably designed to afford them the best protection at the season when the ground is free from snow. In their winter dress they may accord better with a snow-clad landscape.

In regard to goa-shooting, Mr. H. Z. Darrah, in his *Sport in the Highlands of Kashmir*, recommends the sportsman who is on the ground in the late summer to carefully avoid the herds, and to confine his attentions to the small parties of old bucks. If these are seen moving towards ground where there seems to be a fair chance of getting within range, the sportsman should make a circuit and endeavour to intercept them. Under other conditions, it would be preferable to advance straight towards them in the hope of driving them out into the open. Lastly, whether at short or long range, a shot should be taken whenever an opportunity presents itself, as, owing to the habit already mentioned, the sportsman may be assured that, in the event of a miss, there is no fear of his game taking themselves out of the country. With regard to the larger herds, the same writer states that when on open ground they would let nothing approach them within 400 yards; and that it was an impossibility to drive them into broken ground, for the simple reason that they absolutely refused to go.

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The goa's chief enemies, other than man, are probably the snow-leopard, the Tibetan lynx, the wild dog, and the Tibetan wolf, the same animals likewise preying on the chiru. The fawns of both species are doubtless also carried off by eagles more or less frequently.

THE GOITRED GAZELLE

(*Gazella subgutturosa*)

NATIVE NAMES.—*Ahu*, PERSIAN; *Kik* OR *Saikik* AND *Jairan*, TURKI

(PLATE V. FIG. 8)

Although resembling the goa in the absence of horns in the female, the goitred gazelle is a very different animal, easily distinguished by a peculiar dilatable swelling in the throat of the bucks, the absence of a large white patch on the buttocks, the much longer tail, the form of the horns, which are lyrate, with the tips somewhat turned inwards, and the presence of glands on the face below the eyes, and of more or less distinct dark face-markings. In the dilatable larynx, which produces the swelling in the throat, the species is in fact nearly allied to the rather larger Mongolian gazelle, from which it differs in possessing face-markings, as well as by the much greater length of the tail, which is crested with black or blackish brown, and also by the longer horns.

The goitred gazelle is one of those ruminants in which the summer and winter coats are very different, owing to the much greater length and shagginess of the latter. Consequently there is a very considerable difference in the appearance of the animal at the two seasons. In the bucks the lyrate horns diverge near the base, and have the tips turned inwards and converging, so that in a side view they present a not very strongly marked S-like curvature. The ridges on the horns are very strongly marked, and

vary in number from sixteen to twenty-five. In the long winter coat the colour is paler than in summer, but the general coloration may be described as follows :—The upper-parts of the animal are rufescent sandy, while the under portions of the body, parts of the inner and front surfaces of the legs, and the buttocks up to but not including the tail, are white. The white and the fawn are distinctly defined, and separated by a darker band, both on the flanks and the buttocks. In the winter coat the face is also often more or less white, and always shows a longitudinal stripe of fawn colour below each eye, while there may be a more or less distinct dark nose-streak. In old animals these dark face-markings differ generally, however, from those of all other members of the genus except the Marica gazelle of Arabia (in which the females are horned), in that the central dark band, when present at all, is interrupted on the forehead, which is thus pure white. In the summer coat of the typical race there is a pale line above the dark band on the flanks. The tail, which is of the length obtaining in ordinary gazelles, and thus quite unlike the stump which does duty for that appendage in the Mongolian species, is blackish brown or black on the upper surface. From 24 to 27 inches may be given as the approximate shoulder-height of the species.

Such is the general description of the species, but there are at least three well-marked local races of *Gazella subgutturosa*; and it is owing to the existence of these local forms that the animal is here called the goitred gazelle, instead of by its more ordinary title of the Persian gazelle. The reason for the innovation is that if we call the species the Persian gazelle, and then speak of one variety as the Yarkand, and a second as the Altai gazelle, it looks as though we were dealing with three distinct species. By the plan adopted here we have the species designated as the goitred gazelle, and its races respectively distinguished as the Persian, Yarkand, and Altai goitred gazelles.

It is to the typical or Persian race (*G. gutturosa typica*), as the only

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one found within the area treated of in this volume, that attention is now to be directed. The accompanying illustration represents a buck from Teheran, in the winter coat, which was living in the park at Woburn Abbey in 1899, and is now mounted in the British Museum. The condition of the horns, in which the ridges are unworn and continued right down to the base, shows that the animal is adult, although not aged. The height at the withers of the mounted specimen is about 24 inches ; and the horns are relatively long and carry fully twenty ridges. When photographed there was a short but distinct dark streak running down each side of the face from the eye towards the angle of the mouth, but none along the middle of the face, which is pure white. At the time of its death these lateral marks had almost completely disappeared, leaving the whole face white. This slight development of the face-markings seems indeed to be very characteristic of adult bucks of the Persian race in Persia itself. In younger bucks and in does of all ages, as shown by the other members of the Woburn Abbey herd, these markings are much more developed, the cheek-lines being longer and broader, and the frontal streak likewise conspicuous. The whole face is greyish, and the hair of the upper parts of the body much darker and greyer.

The head of a male of this gazelle, shown in Plate V. Fig. 8, which was obtained by Mr. T. W. Greenfield in Baluchistan and presented by him to the British Museum, differs from the Woburn Abbey buck by the much stronger development of the face-markings. The horns indicate an animal of approximately the same age as the latter, are of nearly the same relative length, and carry about the same number of ridges. The strongly defined face-markings comprise one frontal and two cheek-streaks, as in the Woburn Abbey does; the former terminating some distance above the muzzle in the shape of an inverted V. For the greater part of their length these streaks are bright fawn-colour, passing into a blackish brown patch near the middle of their length. In spite of this fuller development

of the face-markings, this specimen may perhaps be assigned to the typical race, although showing an approximation in the feature mentioned to the Yarkand form.

In the *Transactions of the Linnean Society of London*, vol. v. p. 64 (1889), Mr. O. Thomas records the occurrence of the goitred gazelle in Afghanistan, basing the determination on specimens obtained by Dr. Aitchison during his service with the Delimitation Commission. Two



FIG. 28.—Male Persian Goitred Gazelle at Woburn Abbey. From a photograph by the Duchess of Bedford.

pairs of horns presented by Dr. Aitchison to the British Museum apparently indicate that it is the Persian race of the species which is found in Afghanistan. And here it may be mentioned that Dr. Aitchison brought some living specimens of this gazelle, which he presented to the London Zoological Gardens. A descendant of one of them is stated to form the subject of the plate of the Persian gazelle in the *Book of Antelopes*, but it would seem that the artist has largely used the British Museum specimen of the Altai race in making the figure.

If the foregoing determinations are correct, the typical Persian race

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of the goitred gazelle is an inhabitant of the Caucasus, Asia Minor, Persia, Baluchistan, and Afghanistan, although its northern limits are not yet defined. *Gazella subgutturosa typica* is found everywhere in the Persian highlands, from an elevation of about 3000 to some 4000 feet above the sea-level, but is unknown in the plains bordering the Persian Gulf and the Arabian Sea, while in the central deserts of the country it may be more or less replaced by *G. bennetti*. With the exception that it is more of a desert animal, its habits are apparently very similar to those of the ordinary Indian gazelle. The late Sir O. B. St. John states that, like the wild ass, it especially affects the salt deserts, and is thus probably able to exist for long periods without drinking. It appears to breed in the sheltered valleys at the foot of the hills, and is most commonly seen in small parties of from three to half-a-dozen head. When it has a fair start, the Persian gazelle will get clean away from the fleetest greyhounds; but if suddenly roused when reposing in a hollow, or when the ground is heavy from rain, bucks may be pulled down by good dogs. In Baluchistan its habits are doubtless similar. At Woburn Abbey the Persian gazelles were kept in a large paddock, among several different kinds of deer, muflon, etc. As already mentioned, the species has bred in the London Zoological Gardens.

The Yarkand race of the species (*G. subgutturosa yarcandensis*) was described in 1879 by Mr. W. T. Blanford in the *Scientific Results of the Second Yarkand Expedition*, where a coloured plate is given of a group in the summer dress. The specimens came from the neighbourhood of Yarkand and Kashgar, that is to say, from Eastern Turkestan, or what is now frequently called Chinese Turkestan.

In the original description the Yarkand gazelle was stated to differ principally from the typical Persian gazelle in the much darker face-markings, and in the smaller degree of divergence of the horns of the bucks. It was also said to be probably larger, although not much importance was attached to this point, on account of a presumed variation

in size of the typical race. The largest number of ridges on any of the Yarkand horns was fourteen. The colour of the upper-parts of the animals is described as light rufous brown (fawn). In the coloured plate the face-markings are represented as very strongly developed, the middle one running right up the forehead, where it splits to terminate at the base of

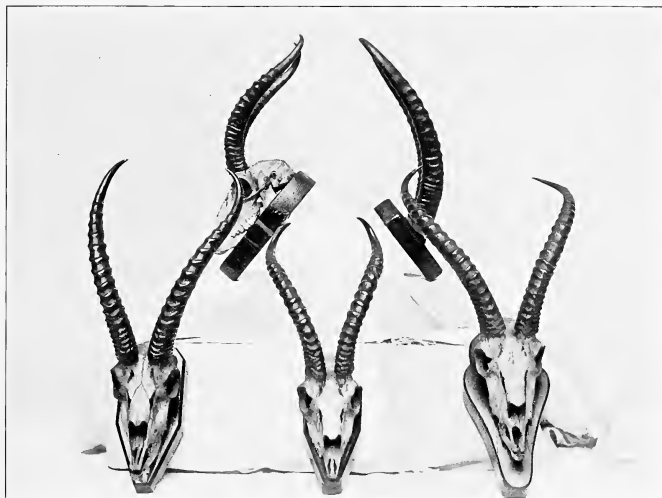


FIG. 29.—Skulls and Horns of Yarkand and Persian Races of the Goitred Gazelle. The specimen shown in the right top and the central lower figure alone belongs to the Persian race. From specimens in the Collection of Mr. A. O. Hume.

each horn; between the dark bands, with the exception of a narrow streak, the greater part of the face is fawn-coloured like the back, so that there is a complete absence of white on the forehead. The white on the buttocks is represented in Mr. Blanford's plate as extending more on to their sides than is the case with the typical Persian gazelle in its winter dress.

A number of skulls of this gazelle, collected by the late Mr. Dalgleish

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while in Yarkand, were presented by Mr. A. O. Hume to the British Museum. The horns of all these are longer and stouter than those of the typical Persian gazelle, and are specially characterised by their much less numerous ridges, which seldom exceed about sixteen in number. The degree of divergence of the horns varies, and does not seem to be a character of much importance. A pair from Yarkand in the possession of Mr. A. O. Hume measures 16 inches in length along the curve and 5 inches in basal circumference.

From the material at present available, it seems that the Yarkand gazelle is a perfectly well-characterised form, distinguished from the typical Persian gazelle by its superior size, the longer and less numerous ridged horns, the more pronounced face-markings, the fawn-coloured forehead, and the greater amount of white on the buttocks. An approach to the present form is, however, so far as the face-markings are concerned, made by the representative of this gazelle from Baluchistan, so that it is rightly regarded as a local race rather than a species. Moreover, a Persian skull presented by Mr. W. T. Blanford to the British Museum has horns more like those of the Yarkand race than is usually the case.

In Mr. Rowland Ward's *Records of Big Game* (1899), pp. 220 and 221, certain gazelle horns and skulls in the possession of Mr. A. O. Hume are figured and catalogued as those of the Mongolian gazelle. These specimens, shown in the illustration on p. 181, come, however, from Eastern (Chinese) Turkestan, two of them being from Lob Nor, on the western border of that territory, near the Gobi desert. They are, therefore, from the distributional area of the present form; that of the Mongolian gazelle being Northern and Eastern Mongolia. They are, moreover, much longer than typical horns of that species, and apparently present no characters by which they can be distinguished from those of the present animal. Moreover, the nasal bones of these skulls have the notched terminal extremities by which the goitred gazelle can at once be

distinguished from both the goa and the Mongolian gazelle, in which the terminal extremities of these bones are entire. The same notching of the nasals is observable in the unusually long-horned skull from Kuldja shown in fig. 30. The range of the Yarkand goitred gazelle apparently extends from Eastern Turkestan to Lob Nor and the confines of the Gobi desert.

But *Gazella subgutturosa* also ranges into the Altai, where it appears to be represented by a third local race. The specimen which may be taken



FIG. 30.—Skull and Horns of Male Yarkand Goitred Gazelle from Kuldja,
in the possession of Sir E. G. Loder.

as the type of this Altai race is an aged buck presented to the British Museum in 1891 by Mr. St. George Littledale. It was shot by that energetic sportsman in the Sair, or Saiar Mountains, situated in the Great Altai on the north-western border of Mongolia, nearly due east of a point midway between the Semipalatinsk and the Semirechinsk Altai, in latitude 86° E., longitude 47° N. It is in the summer coat; and is considerably larger than the typical Persian gazelle, standing about 27 inches at the shoulder.

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Its great age is shown by the nearly smooth, slightly wrinkled band at the base of the ridged portion of the horns ; the ridges themselves being somewhat worn down, and only about twelve in number. Compared with Mr. Greenfield's Baluchistan head referred to the Persian race exhibited in the same case, it seems quite evident that, despite the disparity in age of the two specimens, the horns are of a perfectly distinct type in the two. In the paucity of ridges on the horns the Altai goitred gazelle comes nearer to the Yarkand race of the species, but the horns are much shorter than in the latter. Moreover, with the exception of a pale fawn-coloured streak running from below each eye, the face is devoid of markings and nearly white in colour, thus distinguishing the Altai animal very decidedly from the Yarkand race. Although so much larger than the mounted specimen of the Persian race, the Altai animal has absolutely shorter horns than the latter. It has also much shorter hoofs, but the difference in this respect may be due merely to the nature of the ground on which the two animals respectively lived.

The Altai gazelle appears, then, to be a large local race of *G. subgutturosa*, characterised by its short and sparsely-ridged horns, white forehead, and slightly developed face-markings. It may be known as *G. subgutturosa sairensis*. As already mentioned, the artist appears to have made considerable use of this specimen in the figure of the "Persian Gazelle" given by Messrs. Sclater and Thomas in the *Book of Antelopes*, although the plate is stated in the text to have been drawn from a descendant of an Afghan specimen of the typical race formerly living in the London Zoological Gardens.

The following notes on the habits of the Yarkand race have been kindly furnished by Mr. A. O. Hume :—"In Yarkand and Kashgar they are found throughout the forest belt, and in the deserts bordering these for some thirty miles or so on either side of these belts. Wherever too there is cultivation they may be found in its neighbourhood. They cannot

remain anywhere very far from water, for they drink regularly, and their paths to the water through the desert and through the jungle can always be distinctly traced. But they cross the desert north of the Tarim to the high-road and the cultivation about it, and so are found northwards to the base of the Thian Shan. Though often seen in the desert, where they sleep out in the open in the daytime, and where they spend the night, they resort to the forest or jungle or the edges of cultivation morning and evening, to graze and drink. They never ascend the mountains, though they may be found in the outer ravines of these, and their range may be said to be from 3500 to 5000 feet, or perhaps at Kilian to 6000 feet."

THE CHINKARA GAZELLE

(*Gazella bennetti*)

NATIVE NAMES.—*Chinkara*, *Chikara*, AND *Kalpunch*, HINDUSTANI; *Phaskela* IN THE NORTH-WEST PROVINCES; *Ask*, *Ast*, AND *Ahu*, BALUCHI; *Khazm*, BRAHUI; *Kalsipi* OF THE MAHRATTAS; *Tiska*, *Budari*, AND *Mudari*, CANARESE; *Sankhali* IN MYSORE; *Porsya* (male), *Chari* (female), BAORI; *Burudu-jinka*, TELEGU

(PLATE V. FIGS. 7, 7a)

Although the chinkara must have been known to Anglo-Indian sportsmen since at least the commencement of the present century, it is not a little remarkable that it was not recognised as a distinct species till the year 1831, having previously been confounded with the Arabian gazelle. In the year mentioned it was, however, named *Antelope bennetti* by Colonel Sykes, in honour of the well-known naturalist Mr. E. T. Bennett, at that time secretary of the Zoological Society of London. And

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in due course, when the gazelles were separated from the old and ill-defined genus *Antelope* to form a group by themselves, the present species changed its name to *Gazella bennetti*. By a large number of Anglo-Indian sportsmen this beautiful little gazelle is commonly spoken of by its Hindustani title of chinkara, and no better name could be desired. Unfortunately, however, it has also acquired the name of "Ravine Deer,"—a title which is one of the worst misnomers in existence, as if there are two groups of animals which ought not to be confounded with one another, they are antelopes and deer. But even at the present day there are people who fail to recognise the essential difference between horns and antlers, so that it is by no means uncommon to hear many of the antelopes of Africa spoken of as deer !

Having settled, then, that the creature should, if not designated simply by its native title, be called a gazelle and not a deer, its personal characteristics may be taken into consideration. And in this connection it is important to notice that the chinkara is a much more typical gazelle than either of the species hitherto described. That is to say, it agrees with the great majority of the members of that extensive and widely-spread group of antelopes in its leading characters, so that it has to be distinguished from its nearest relatives by comparatively minute details. Fortunately for the sportsman who aspires to be a naturalist, the chinkara is the only one of the more typical gazelles to be met with in India, so that there is no sort of difficulty in its identification.

From both the goa and the goitred gazelle the chinkara differs in that the doe is furnished with horns. The fact that the horns of the bucks do not turn in at the tips serves at once to distinguish the species from the goitred gazelle (from which it also differs by the absence of the swelling in the throat of the bucks), while the want of a large white tail-patch (to say nothing of the great difference in the curvature of the horns) separates it at a glance from the goa.

In size the present species is about equal to the Persian race of the goitred gazelle, the usual height being about 23 or 24 inches at the withers and 26½ inches at the rump. A fat buck is stated to weigh about 50 lbs., and a doe from 10 to 15 lbs. less. Although from 10 to 12 inches is the average length of the horns of bucks, and their basal girth about 4 inches, specimens respectively measuring 14½ and 15 inches in length are recorded by Mr. Rowland Ward, the longer of these having a basal circumference of 5 inches. Female horns are much smaller, 8 inches being apparently the longest length on record.

In the buck the horns are nearly straight, showing a small lateral divergence when viewed from the front, but with a slightly S-like curvature when seen from the side, with the tips bending slightly forwards. Generally the number of ridges on each horn is fifteen or sixteen, but there are at least seventeen or eighteen in the specimen here figured (which has the second longest horns on record), and it is stated that there may be as many as twenty-five. In the females of the typical Indian race of the species the horns are quite devoid of ridges.

The face has a distinct gland, opening by a small aperture, below each eye; and the knees are furnished with the usual brushes of stiff hairs.

As regards colour, the chinkara has the usual gazelle face-markings well developed. The general hue of the upper-parts is light chestnut, becoming somewhat darker at the junction with the white of the flanks and buttocks, although not showing either a distinct dark lateral band or a pale streak. The chin, chest, under-parts of the body, and a streak on the sides of the buttocks are white, the white stopping short of the root of the tail. The tail itself is very dark brown or black; but the knee-brushes are



FIG. 31.—Head of Male of Indian Chinkara Gazelle. From a specimen shot by Mr. L. M. le Champion.

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somewhat variable in colour, although frequently also dark brown. The face has a whitish streak running down each side, externally to which is a rufous stripe, while the middle, from the roots of the horns to the nostrils, is dark rufous, with sometimes a dusky patch immediately above the nose.

In Sind and the Indian desert the chinkara assumes a paler tone of coloration than usual, as is so commonly the case with desert-dwelling animals. And if this difference be considered worthy of subspecific distinction, the desert form should be known as *Gazella bennetti christyi*.

The geographical distribution of the chinkara extends from the plains and low hills of North-Western and Central India through Baluchistan to the eastern shore of the Persian Gulf. The Baluchi and Persian form differs, however, in certain characters of the female, and is accordingly referred to a distinct race, which is noticed below. The Indian, or typical race (*G. bennetti typica*), unless the pale Sind variety be separated, is found in suitable localities over a considerable area of the peninsula, being met with all over the Punjab, Sind, Rajputana, the North-West Provinces, and the Bombay Presidency, with the exception of the western Ghats and Konkan. In Central India it occurs as far east as Palamow and the western portion of Sarguja; in the Central Provinces it has been met with as far to the eastward as Seoni and Chanda; while it also occurs in Hyderabad territory, and in the Madras Presidency to some distance south of the Kistna valley, having been recorded from Anantapur, to the south of Kurnul, as well as in the north of Mysore.

The chinkara is nearly allied to the Arabian and Muscat gazelles (*G. arabica* and *muscatensis*), as well as to the Dorcas gazelle (*G. dorcas*) of North Africa. And from this relationship it has been suggested in the *Book of Antelopes*, by Messrs. Sclater and Thomas, that it is a comparatively recent immigrant into India from the west. It should, however, be remembered that fossil remains of gazelles occur in the Tertiary rocks of the Siwalik Hills and other parts of the Sub-Himalaya; one of the species (*G. porrecti-*

cornis) showing some resemblance to *G. granti* of East Africa. Hence there is a considerable likelihood that Asia may have been the original home of the gazelles, especially when we recall the fact that several groups of antelopes now restricted to Africa formerly occurred in India. Moreover, a gazelle (*G. anglica*) inhabited England at a period much later than the one when the group was first known in India, thereby suggesting a migration from the east instead of from the west.

In its general habits the chinkara is very similar to the majority of the more typical members of its genus, being generally found in small parties of from two to half-a-dozen individuals, although on rare occasions as many as from ten to twenty may be seen in company. Seldom seen on alluvial plains, and avoiding cultivated land to a much greater extent than the blackbuck, the chinkara is partial to more or less sandy, open tracts of uncultivated lands, especially those much cut up by ravines; the sand-hills of the Indian desert being an especially favourite resort of the species. It is, however, by no means confined to open country, being often met with in thin bush or tree-jungle; while, where the country is suitable, it may be found on the tops of hills. Grass and the leaves of bushes and shrubs form its chief nutriment; and although partial to the luscious grass growing in the neighbourhood of water, it is believed by competent observers never to drink, being often found during the hot season where there is no water save that in deep wells. Even in places where water is found, Mr. Blanford states that he never saw the easily-recognised foot-prints of gazelles among those of the animals that habitually came to drink at the pools.

As recorded by Dr. Jerdon, this gazelle, during the rainy season, is much troubled in Harriana, at any rate, by a kind of maggot, or bot, under the skin at the root of the tail; and the following curious incident, for the truth of which the anonymous author must be held responsible, appeared in *The Asian* newspaper of 7th November 1899:—"While out shooting in the

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H—— district during the month of February a couple of years ago, I was greatly interested and amused by the antics of a fox and a herd of chinkara I was stalking. I had got behind a hay-rick about 50 yards from the herd, when I observed a fox cautiously creep out from his burrow and stalk the buck nearest me. On getting to within about a yard of the buck, the fox crouched and commenced shaking himself from side to side just as a cat does preparatory to springing. The buck prepared to meet the attack by coming to the charge, but hardly had he done so, when the fox sprang at him and caused him to give a big bound to one side. These tactics over, the fox promptly started sniffing about and greedily devouring something he found. The operation I have described above was repeated about a dozen times with different members of the herd, when I cut the proceedings short with a shot. I rolled over the buck I fired at, and getting to the place where he lay hunted about to ascertain what the fox had been devouring. I found several whitish grubs, about the size and appearance of a newly turned chrysalis of the common wild silkworm lying about, and was at a loss to know how they came there till the buck I had shot was skinned. I then discovered about fifty or sixty of these grubs (bots) all along the spinal column under the skin, the larger ones partly protruding. Indeed, the skin, when it was removed and stretched, looked as if a charge of No. 1 shot had been put into it.

“Here then was the mystery of the performance I had witnessed. The whole thing seemed quite clear to my mind and pre-arranged. The fox gave the chinkara a start to make him bound, and the act of bounding, by tightening the skin, expelled the mature bots, and so provided him with a dainty morning meal, while it rid the chinkara of a painful and troublesome pest.

“I shot some five or six more ‘chinkara’ after this, and they were one and all similarly infested with those bots, while curious to say four black-buck I shot were quite free from them.”

According to the observations of the late Sir Walter Elliot, the bucks of the chinkara fight after the manner of rams, running at one another from a short distance, and striking their heads together with great violence. When alarmed, it stamps smartly with the fore-feet, like a sheep, at the same time uttering a loud hiss, whence it derives its Canarese name of *Tirka*. Does may often be seen followed by a pair of fawns ; but it does not appear that either the pairing-time or the duration of the period of gestation is known.

The flesh of the chinkara is of excellent quality for the table, being much superior to that of the blackbuck ; and as the species is so frequently found in broken ground, where stalking is comparatively easy, it affords very pretty shooting with a small-bore rifle, although the smallness of the mark renders accurate shooting essential. In spite of their general wildness chinkara do not go far when disturbed, so that with patience a shot is in most cases obtainable. On the fringe of the Indian Desert, where covert is scarce, a reliable shooting horse, or, still better, a riding camel, is often essential to enable the sportsman to get within range. Fidgety and restless at times, and even when feeding constantly switching their tails from side to side, these gazelles when frightened invariably start off at once at a racing gallop, without the preliminary bounds so characteristic of their cousin the Indian antelope. Their speed is so great, and their endurance so marked, that it is seldom that they can be overtaken by dogs, although such a feat has been occasionally accomplished. The natives of certain parts of India were formerly, at any rate, in the habit of hunting the chinkara with the aid of the saker falcon, the bird being first flown at the animal, so as to strike it on the head and render it confused, when the greyhounds were slipped to rush in and pull it down.

THE BALUCHI CHINKARA

(Gazella bennetti fuscifrons)

Whether the Baluchi representative of the chinkara is really entitled to rank as a distinct race, or subspecies, may, perhaps, be open to doubt, but as it has received a separate name, it may be alluded to under that title. *Gazella fuscifrons* was named by Mr. W. T. Blanford in 1873 on the evidence of a female head obtained by the late Sir O. B. St. John at Jalk, in Northern Baluchistan. Its chief claims to distinction are that the horns, which measured $7\frac{1}{4}$ inches in length, are distinctly, although not very prominently ridged, or ringed, and that the darker portions of the face are dark brown, instead of rufous. When the male was subsequently discovered, it was found not to differ perceptibly from the ordinary Indian chinkara, except that the horns are a little more curved backwards, and slightly more lyrate when viewed from the front. From Baluchistan the chinkara extends to the head of the Persian Gulf in the neighbourhood of Bushire. There it inhabits the low country, as it does in Baluchistan, not ranging above the 3000 feet level, where it is replaced by the goitred gazelle, which can be easily recognised, even at a comparatively long distance, by its much lighter colour.



PLATE VI

- | | |
|--------------------|------------------|
| 1. Hangul. | 5. Malay Sambar. |
| 2. Shou. | 6. Chital. |
| 3. Thorold's Deer. | 7. Swamp-Deer. |
| 4. Indian Sambar. | 8. Thamin. |



THE HANGUL, OR KASHMIR STAG

(Cervus cashmirianus)

NATIVE NAMES.—*Hangul*,¹ *Honglu* (male), *Minyamar* (female), KASHMIRI ;
Barasingha, HINDUSTANI

(PLATE VI. FIG. 1.)

From the other representatives of the typical ruminants the great majority of the members of the deer tribe are distinguished by the cranial appendages of the males taking the form of antlers, which are periodically shed and again renewed, and in all the Asiatic forms are more or less branched. In none of the deer with which we have to deal in the present volume are the females, or hinds, normally provided with antlers : and in the few species in which these appendages are lacking in both sexes, the males are provided with long sabre-like tusks in the upper jaw projecting below the margin of the lip. In the latter respect these uncrowned species resemble the chevrotains, or mouse-deer, from which, however, as pointed out in the sequel, they are readily distinguished by certain important features of their internal anatomy. The mode of replacement and growth of antlers, as well as their essential structural difference from horns, properly so-called, have so often been described,² that a repetition on this occasion is quite unnecessary. It may be observed, however, that in those species in which they eventually attain a more or less complex development, they are always of more simple type in the young than in the fully adult animal, their complexity increasing (although not with the extreme regularity that has been stated) year by year till a certain period of life, after which they commence to degenerate, or “go back.”

¹ Mr. Blanford gives the name as *Hangal*.

² See *Deer of All Lands*.

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The great majority of deer are further characterised by the marked difference between the colour of the winter and the summer coat, the general tone of the former being some shade of grey or brown, while that of the latter is chestnut or rufous. Among the species exhibiting this colour-change in its greatest perfection are the common American or Virginian deer, and the roes, the latter being further remarkable for the circumstance that the white rump-patch, which forms such a conspicuous feature in so many of the tribe, is, in general, developed only in the grey winter coat. The presence of the aforesaid white rump-patch in so many deer appears to be due to the necessity for rapid recognition of the whereabouts of their fellows when the herd takes to flight. Other aids to mutual recognition are afforded by the glands with which deer are so abundantly provided. Most deer have a pair of glands on the face below the eyes, while in the muntjac there is also a single frontal gland on the forehead. In addition to those on the face, the majority of the tribe have glands situated between the main hoofs, while there may likewise be either one or two glands on each hind-leg, the position of which is indicated by a tuft of hair differing in length and frequently also in colour from that with which the rest of the limb is clothed. The more commonly developed of these glands is situated on the outer surface of the hind-legs some distance above the foot, and is known as the metatarsal gland. Less common is the tarsal gland, whose situation is on the inner surface of the hock, or tarsus.

All male deer are subject to violent outbursts of sexual excitement during the pairing-season, when they lose their ordinary timid and retiring habits, and become some of the most vicious and dangerous of all animals, especially when kept in a state of captivity. During this period of excitement the males of the larger kinds utter a peculiar call or roar, apparently chiefly intended as a challenge to their rivals for the mastery of the herd.

In the typical genus *Cervus*, of which the hangul is a member, the antlers

of the males are large and complex, rising at an acute angle to the middle line of the forehead, projecting at first from the plane of the latter, and then continued upwards nearly in that plane. They are supported on comparatively short, permanent, and skin-covered pedicles (longer in young than in fully adult animals), and are always furnished with a brow-tine, while they are never regularly forked at their first division. Three is the minimum number of tines met with in the antlers of this genus. There



FIG. 32.—Hangul Stag at Woburn Abbey. Photographed by the Duchess of Bedford.

are other distinctive features of the group, of which mention may be omitted on the present occasion.

The deer of the genus *Cervus* may be divided into five subgeneric groups, of which three are met with in the area treated of in the present volume. In the typical group (to which belong the largest species, and of which the hangul is a member) the antlers are rounded, and usually bear five or more tines, among which there is generally a bez (second) and always a trez (third). In the adult males the coat is more or less completely devoid of spots, and has a large light-coloured rump-patch generally surrounding the tail, while the young are invariably marked with rows of light spots.

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The hangul, to give the species the title by which it is invariably known in its native country,¹ may be regarded as the Kashmir representative of the European red deer, from which, however, it is so different as to be unquestionably entitled to rank as a distinct species. The antlers are usually five-tined, with the brow-tine (which is often shorter than the bez) generally starting at some distance above the burr. The fourth and fifth tines of the antlers, which are often of approximately equal size, form a terminal fork, which is placed somewhat obliquely to the long axis of the head. They are rounded throughout, and are bowed outwards at first and then inwards, so that the fifth tines of opposite sides are inclined towards one another. The legs are thicker than in the red deer, with the tuft of the metatarsal gland larger, coarser, and placed somewhat lower down. In height a full-grown stag stands from 4 feet to 4 feet 4 inches at the withers. The tail is relatively short, and the light rump-patch, which is nearly white, is small, and does not extend on to the upper surface of the buttocks, thereby excluding the tail.² In winter the general colour of the coat varies from brown to liver-colour, the individual hairs being speckled; the light area on the inner sides of the buttocks is dirty white, with a dark line on its outer border, which runs down the inner side of the thigh, and stands out in contrast to the general body-colour. The flanks and limbs are somewhat paler than the back; the upper surface of the tail is black; and the lips and chin are white, and the inner surfaces of the ears whitish. In the summer coat the general colour is lighter and more rufous, with most of the under-parts whitish, although posteriorly brown in the stags. At this season the hinds, and sometimes also the stags, show traces of spotting on the flanks and back. The fringe of elongated hair on the throat is comparatively short, and

¹ Kashmiri shikaries only apply the term *Barasingha* to this deer when addressing Europeans.

² This feature occurs in the mounted specimen in the British Museum (figured in *Deer of All Lands*), as well as in the skin of a second recently presented to the Museum by the Duke of Bedford, and in two living examples at Woburn Abbey, so that it may be regarded as practically constant.

not markedly darker than the rest of the coat. The young are stated to retain their light spots till the third or fourth year. The cry of the male hangul in the pairing-season is a prolonged squeal, quite unlike that of the red deer, and approximating to that of the wapiti. In the whiteness of the light rump-patch and its dark-coloured edging the hangul departs from the red-deer type to approach the group of Asiatic deer



FIG. 33.—Male Hangul, with the antlers in velvet. From a photograph by the Duchess of Bedford.

known as sikas, as it also does to a certain degree in its comparatively simple antlers.

The maximum lengths of antlers of this deer recorded by Mr. Rowland Ward are 48 and 47 inches, one of three examples with the latter dimension showing a tip-to-tip interval of 21, and a second of 30 inches.

The true hangul inhabits the forests of the vale of Kashmir and some of the neighbouring valleys, such as Maru-Wardwan, Kishtwar, Badrawar, and Tilel, but further information is required with regard to the exact limits of its distribution in the vale of Kashmir itself. It is well known

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that hangul are to be met with throughout the range forming the north-eastern barrier of the valley, as well as that at its south-eastern extremity. In the *Deer of All Lands* it is stated that they are unknown on the Pir Panjal range, forming (with the Kaj-nag to the west of the Jhelam) the south-western barrier of the valley. And a practically similar statement is made by Monsieur Dauvergne (a keen sportsman resident for many years in Kashmir) in a paper on the "Big Game of Asia" published in the *Bulletin* of the Paris Museum of Natural History for 1898. His words (p. 200) are that the distribution of these deer is limited to *toutes les montagnes autour de la vallée au nord*, together with Kishtwar and some adjacent districts. Consequently the Pir Panjal and Kaj-nag ranges are expressly excluded from the habitat. The present writer has indeed seen hangul on the Marbal Pass, situated on a northern spur of the eastern extremity of the Pir Panjal; and as this is the direct route to Kishtwar it clearly comes within their ordinary range, and in no wise invalidates the above statements. He has, however, been shown a note by an English sportsman in which it is stated that about thirty years ago (at which time Monsieur Dauvergne was resident in Kashmir) hangul were seen near the Pir Panjal Pass, which is almost in the centre of the range. Possibly these were only stragglers, but in any case, this point would appear to be their extreme western limits on this side of the valley, as the writer has never heard of their occurrence west of the pass last named or in the Kaj-nag.

In summer hangul may be met with as high as from 9000 to 12,000 feet above sea-level, but in winter they descend to the valley of Kashmir, which is in some places not more than 5000 feet above the sea. The herds resorting to the western end of the vale of Kashmir pass northwards in summer into the adjacent Tilel valley, through which runs the Kishan-ganga, some of them crossing that river to wander into the mountains of southern Astor. On the other hand, those from the northern and eastern

flanks of the Kashmir valley will retire to the slopes of Haramuk,¹ the great peak in the northern mountain barrier. At the eastern end of the vale the deer appear to migrate much less than do those at its western extremity, finding a suitable summer climate at the sources of the tributary valleys, or *nalas*; their favourite summer resorts being the birch-forests, which grow immediately above the upper limit of the pine-zone.

Towards the end of September, when the antlers of the stags are clean, the Kashmir hangul descend from the birch-forests, and the old stags commence to call. Formerly they are stated to have called throughout the day, but now do so only in the mornings and evenings, commencing in the late afternoon. During the pairing-season the old stags frequently show themselves in the open glades with their harems of hinds, and are then most easy to approach. They wander frequently from one patch of forest to another, so that a spot abounding in deer one week may be deserted the next. By the latter part of October the calling of the stags generally ceases, and they then become less bold, and are consequently much more difficult to discover. When, however, they are driven down by the winter snows into the open ground of the vale of Kashmir, they are once more easily approached, and in former times numbers of them were ruthlessly slaughtered by the villagers when thus driven down by the storms of winter to seek shelter at low levels. The beautifully dappled fawns are generally dropped during the month of April.

An excellent account of hangul stalking in Kashmir will be found in General Macintyre's work entitled *The Hindu Koh*.

The constancy of the small size of the rump-patch in the hangul, and its non-inclusion of the tail, seem to indicate that the Yarkand stag, which inhabits the forests of the Tarim Valley and Maralbashi, in Eastern Turkestan, is entitled to rank as a distinct species (*C. yarcandensis*), and can no longer be regarded merely as a local race of *C. cashmirianus*, since the

¹ This peak must not be confounded with Haramosh, in the Gilgit district.

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skin brought home by Major C. S. Cumberland is described by Mr. W. T. Blanford as having a well-defined rump-patch. The antlers, too, differ from those of the hangul in that the terminal fork is placed at right angles to the axis of the head, and so looks directly front, while the fifth tine is generally decidedly larger than the fourth. Moreover, in some specimens, as in the one here figured, the upper part of the antler



FIG. 34.—Skull and Antlers of Yarkand Stag. From a specimen in the British Museum figured by Mr. Blanford in the *Proceedings of the Zoological Society* for 1892.

is more curved forwards, somewhat after the manner obtaining in the shou. Indeed, in all the above-mentioned respects the antlers are decidedly more shou-like than are those of the hangul.

A stag in the Zoological Gardens at Moscow, figured on p. 109 of *Deer of All Lands*, and subsequently named by the writer¹ *Cervus bactrianus*, has a large rump-patch and remarkably shou-like antlers.

¹ *Ann. and Mag. Nat. Hist.* ser. 7, vol. v. p. 195 (1900).

It is reported to come from Russian Turkestan. With the exception that the bez-tine is wanting (which may be an individual peculiarity), the antlers are also very like those of the Yarkand stag. A stag from Tashkend, now living at Woburn Abbey, which has a large yellowish patch



FIG. 35.—Skull and Antlers of six-tined Yarkand Stag. From a specimen in the Collection of Mr. A. O. Hume.

surrounding the tail, and a large and coarse metatarsal tuft, seems to be specifically identical with the Moscow specimen, although at the present time the antlers are unfortunately malformed. Like the Moscow specimen it is pale-grey at all seasons. It seems highly probable that *C. bactrianus* will eventually prove to be very closely allied to *C. yarcandensis*, of which,

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indeed, it may possibly be merely a local race, although in the type specimen the antlers curve more forwards.

THE SHOU, OR SIKHIM STAG

(*Cervus affinis*)

NATIVE NAME.—*Shou* (pronounced *shoe*), BHOTIAS OF NEPAL AND
DARJILING

(PLATE VI. FIG. 2)

Although its magnificent antlers are fairly common in museums and private collections, apparently only one or two living British sportsmen have ever seen the lordly shou in the flesh, while by only one has it hitherto been shot. Indeed, at the present day, this deer is chiefly known by its skulls and antlers, although the British Museum possesses one mounted head, and there is a second in the possession of the present Political Officer in Sikhim. Of the general appearance of this magnificent animal our sole knowledge is derived from two coloured sketches formerly belonging to its describer, Brian Hodgson, and now preserved in the library of the Zoological Society of London.

Shou antlers present the same marked bend at the third tine and the inward inclination of the long fifth tine so conspicuous in the Kashmir hangul, in addition to which they are also abruptly bent forward above the third tine, so that when suspended in the ordinary position the upper portion of the antlers overhangs to a marked degree the skull. As in the hangul, there are usually five points; but the brow-tine seems to be less constantly longer than the second, and is closer to the burr than is often the case in the Kashmir animal. More important is the circumstance that the terminal fork is placed at right angles to the axis of the head, so as to look directly forwards; and the fifth tine is nearly always

markedly larger than the fourth. Judging from the size of its skull and antlers, the shou must apparently fall but little if at all short of the stature attained by the wapiti. As regards coloration, accurate information is a desideratum. The mounted head in the British Museum, which must have suffered considerably by fading since it was presented half a century



FIG. 36.—Skull and Antlers of Shou. From a specimen in the possession of Mr. A. O. Hume.

ago by Brian Hodgson, is pale rufous brown. A somewhat similar colour, which extends over the whole of the rump, is displayed in one of the sketches noticed above ; but in the second of these, which not improbably shows the animal in its winter garb, the general hue is considerably darker, and there is a large light rump-patch, which includes the tail.

The largest shou antlers on record are the pair figured in the

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accompanying cut, which measure $53\frac{3}{4}$ inches in length, $6\frac{1}{2}$ in basal circumference, $17\frac{1}{4}$ between the tips, and $40\frac{3}{8}$ inches in maximum inside span. In the next largest example the corresponding dimensions are $54\frac{3}{8}$, $6\frac{5}{8}$, $21\frac{3}{8}$, and $37\frac{1}{2}$ inches. In nearly all cases at least one antler has five well-developed points, but occasionally its fellow may have four, six, or seven points. By sportsmen the shou is commonly termed the Sikhim stag, but whether it actually occurs in Sikhim itself is not quite certain. The writer is, however, informed by the Political Officer in Sikhim that it is found in the tributary Chumbi valley, among the rhododendron forests, at elevations between 9000 and 12,000 feet.

So far as can be judged at present, the shou seems to be closely connected with the hangul by means of the Yarkand stag and the Bactrian species; all having antlers of the same general type, and probably also the same large and coarse metatarsal tuft.

THOROLD'S DEER, OR LHASA STAG

(*Cervus albinostris*)

(PLATE VI. FIG. 3)

Although a member of the typical group of the genus *Cervus*, Thorold's deer is readily distinguished from all its immediate relatives by its pure white muzzle, lips, and chin, by the remarkable reversal of the hair on the withers, which forms a kind of hump, and is directed forwards, and also by the comparatively simple antlers, which lack the bez-tine, and have but four or five points each.

In size this deer (which is represented by a mounted specimen in the British Museum) is very nearly the same as the Kashmir hangul. The antlers, which, as already mentioned, lack the bez-tine and carry either

four or five points, are much flattened throughout their length and have the beam suddenly bent back at the trez-tine (in the present species owing to the absence of the bez, the second of the series). The brow-tine springs from the beam some distance above the burr; the trez-tine is situated nearly in the plane of those above it, the tine immediately above the trez being larger than any of the rest. The antlers differ widely from those of the hangul and shou, in that the terminal fork is parallel to the long axis of the head, as in the wapiti. The tail is short, and included in the large light rump-patch. As regards colour, the coat of the British Museum example is uniformly dark brown with the hairs minutely speckled, and scarcely lighter on the under part of the body than on the back. The rump-patch, which extends down the inner sides of the thighs, is pale ochrey buff, without any white below the tail, but bordered with blackish in front. The face is somewhat darker than the back; the inner surface of the ears is whitish, and, as already mentioned, the muzzle (with the exception of the bare moist portion), lips, and chin are pure white. The hair is remarkable for its coarseness and brittle nature; and the metatarsal gland, which is covered with very coarse hair, is situated about halfway up the cannon-bone.

Although this deer has doubtless a not very remote connection with the hangul and the shou, it appears—especially in the formation of the antlers—to display decided indications of affinity with the sika deer, from which, indeed, it may indicate a connecting link towards the wapiti.

This deer was first described by Col. Przewalski, the two specimens subsequently obtained by Dr. W. G. Thorold in the neighbourhood of Lhasa being named *C. thoroldi*, under the impression that they belonged to a new species. The two examples in question were killed at a spot about 200 miles to the north-east of Lhasa, at an approximate elevation of about 13,500 feet above sea-level. They were found in snow among brushwood growing just above the upper limit of forest.

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A local race of the wapiti (*Cervus canadensis asiaticus*) occurs in the Altai and Thian Shan, and in Manchuria and Amurland there is also *Cervus xanthopygus*, which is in some respects intermediate between a red deer and a wapiti. It has, for instance, an extremely short wapiti-like tail; and the antlers are also of a wapiti-like type, although smaller in proportion to the head, and with an inferior development of the fourth tine in sub-adult individuals. On the other hand, the coat turns bright foxy red in summer, as in the red deer. When the antlers are five-tined they may be distinguished from those of the hangul and shou by the terminal fork being parallel to the axis of the head. The deer described as *C. luehdorfi* appears inseparable from *C. xanthopygus*, of which there is a large herd now living at Woburn Abbey. Neither of the above-mentioned deer, nor any of the species of sika deer, are met with in the area treated of in this volume.

THE INDIAN SAMBAR

(*Cervus unicolor*)

NATIVE NAMES.—*Sambar* or *Samar*, HINDUSTANI; *Jarao* (male), *Jurai* (female), NEPALESE; *Maha* IN THE TERAI; *Meru* AMONG THE MAHRATTAS OF THE GHATS; *Ma-ao* AND *Mauk* OF THE GONDS; *Saram* OF THE HO-KOL; *Kadave* AND *Kadaba*, CANARESE; *Kennadi*, TELEGU; *Kadumai*, TAMIL; *Gona Rusa*, CINGALESE; *Gous*, *Gaoj*, AND *Bhalongi* (female) IN EASTERN BENGAL; *Khat-khowa-pohu*, ASSAMESE; *Sacha* IN THE DAPHLA HILLS; *Tshat*, BURMESE; *Takhau*, *Hseukhau*, AND *Kheu* OF THE KARENS; *Rusa* AND *Rusa-etam*, MALAY

(PLATE VI. FIG. 4)

Despite the comparatively simple form of its antlers, and its somewhat shaggy and occasionally even "untidy" appearance, the sambar must

undoubtedly be reckoned as the finest representative of the deer tribe found in India proper. In size and bulk it considerably exceeds all the rest; and for solid massiveness its rugged antlers, whose outer surface presents a curious resemblance to the bark of a wych-elm sapling, are perhaps unsurpassed by those of any other member of the family *Cervidae*. Magnificent specimens of these antlers, obtained many years ago, are preserved in the British Museum and in many private collections, the equals of which it would be difficult, if not impossible to find at the



FIG. 37.—Sambar Stag at Woburn Abbey. Photographed by the Duchess of Bedford.

present day, when comparatively few stags are allowed to attain the age necessary for the full development of these splendid appendages.

The sambar, in common with a number of more or less closely allied species inhabiting the Oriental or Indian region, differs so markedly, not only in the form of its antlers, but in many details of structure and coloration, from the members of the red-deer group, that it may be unquestionably taken as the typical representative of a second group, for which the name of rusine deer (taken from the Malay name for deer) will be found a convenient designation. With the exception of one small species, supposed to be from the Philippines, and recently described under

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the name of *C. tavistocki*,¹ all these rusine deer are characterised by their relatively simple antlers, which are cylindrical, and have usually but three tines, owing to the absence of both the bez and the trez. Accordingly each antler, after giving off a brow-tine immediately above the burr, or coronet, consists merely of a beam terminating in a simple fork. Although the coat of the adult may be either uniformly coloured or spotted at all times of the year, it has never the distinct, large, light-coloured rump-patch of the red-deer group, nor does it exhibit that marked difference in colour according to season which forms such a striking feature in most members of the same group. Several species (like the sambar itself) have the throat and neck more or less heavily maned; and in most cases the ears are relatively large, and the tail comparatively long.

The Indian sambar (which is the typical representative of a widely spread species, having many local races, and whose full title is *Cervus unicolor typicus*) is a large and somewhat heavily built deer, attaining a height of at least 5 feet 4 inches at the withers, and characterised by its long and almost uniformly dark-coloured coat, heavily maned throat and neck, large spreading ears, evertible face-glands, and thick bushy tail. The long and massive antlers have a peculiarly rugose and rugged exterior, and the two tines of the terminal fork are usually of approximately equal length; if, however, these latter are unequal, it is generally the front one which is the shorter of the two, while the hinder one springs from the posterior aspect of the beam, and does not form the direct continuation of the axis of the latter. The space enclosed between the two antlers is generally U or V-shaped, and the bony pedicles on which they are supported are relatively short. In general colour a sambar is usually of a nearly uniform dark umber-brown, but there is a considerable amount of individual variation in this respect, some specimens, and especially hinds (which are markedly paler than the stags), tending more or less decidedly to greyish

¹ See Lydekker, *Ann. and Mag. of Nat. Hist.* ser. 7, vol. vi, p. 205 (1900).

or yellowish. Old stags may become almost black ; and in lighter-coloured males the face, mane, and the upper surface of the tail are black



FIG. 38.—Head of Indian Sambar.

or blackish. On the under surface of the body the hair is but little paler than on the back ; but in the stags the chin, the inner portion of the buttocks, the under side of the tail, and the inner surface of the upper

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part of the limbs are more or less distinctly chestnut, and this chestnut may extend on to the sides of the buttocks, and occupy the whole of the lower portion of the legs. On the head and neck the hairs are uniformly coloured, but those on the hinder half of the body may have yellow tips. Young fawns are uniformly red, without light spots, but apparently with a black tail and a stripe of the same colour down the middle of the back. The broad ears of the adult are about equal to half the length of the head, the latter having a nearly straight profile, and being of considerable relative length.

Sambar antlers vary greatly in relative length and stoutness, the longer specimens being frequently inferior in girth to shorter examples. Seldom are there more than three tines to each, although occasionally a fourth point may be added, and still more rarely each tine may bifurcate (fig. 39). The longest specimen recorded by Mr. Rowland Ward is a single antler from Khandesh, of which the length is 48 inches, and the girth above the brow-tine 7 inches. Specimens measuring $46\frac{7}{8}$, $46\frac{1}{2}$, and $45\frac{1}{2}$ inches in length are on record, one of these having a basal girth of 9 inches. The maximum basal girth (10 inches) is, however, reached in a specimen measuring 43 inches in length. A pair of broken antlers from the Central Provinces, mentioned by Mr. A. O. Hume, appear, when complete, to have been close on 50 inches in length, their inside measurement, in their broken condition, being 48 inches. A stag sambar will weigh about 600 lbs. "live weight," and about 410 lbs. "butcher's weight."

The forests of India and Ceylon, especially those in hilly districts, form the habitat of the typical race of the sambar. Eastwards the limits of the race may not improbably be formed in Assam by the Bramaputra, on the further side of which the Malay form of the species most likely occurs. From its smaller size, the Ceylon representative of the sambar may perhaps be entitled to rank as a race apart. Throughout the open plains of the Punjab, Sind, and Western Rajputana a forest-dwelling

animal like the sambar is, of course, unknown. In the outer ridges of the Himalaya, where its extreme western range does not yet appear to be ascertained, sambar may occasionally be found as high as 9000 or even



FIG. 39.—Skull of Indian Sambar with abnormal Antlers. From a specimen in the possession of Mr. Bertram-Carey.

10,000 feet above sea-level, and they are commonly met with on the summits of the Nilgiris and other ranges in Southern India, as well as at Newera Ellia in the Ceylon highlands. Although, as already mentioned,

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hills form their favourite resorts, these deer may occasionally be met with on river-flats at a considerable distance from broken ground of any kind.

Sambar are generally to be met with in small herds or family parties, and, like all forest-dwelling animals, are exceedingly impatient of the rays of a tropical sun between early morning and evening, seeking shelter from the same in the deepest and most sequestered parts of the forest during the hottest hours of the day. In the Siwaliks the resting-place may, however, be under an isolated tree. Whenever such are to be found in the vicinity of their haunts, they select the forests on the higher grounds for the mid-day siesta. Whether they require water every day is a question still open ; but it is well known that they are frequently in the habit of travelling long distances in search of that element. Unlike the members of the red-deer group, wild sambar do not shed their antlers by any means regularly every season ; and in at least many parts of both India and Ceylon these massive appendages are dropped by the stags only every second or third year. Such, at any rate, is the testimony of those who have had ample opportunities of studying these deer in their native wilds. The month of March is stated as the time in which the shedding most generally takes place in the plains, while in the Himalaya April is the more usual season. In the plains the master stags call during October and November, and during this season these deer collect in much larger herds than at other times of the year. The call of the stags is a loud metallic bellow, to which the hinds reply by a kind of grunting low. The fawns in the plains of India are born during June and July, and it is but very rarely that twins occur. In the herd of sambar kept at Woburn Abbey the fawns are, however, produced at all times of the year, and the same is the case with the shedding of the antlers, which appear to be dropped annually. It has been suggested, indeed, that with these sambar the time of shedding the antlers depends on the season of the year at which each particular individual came into the world. Whether this irregularity in the season of birth

and the consequent difference in the time of year at which the antlers are shed is solely due to the abnormal environment of the Woburn herd, or whether it can in any degree be matched in a state of nature, remains to be proved. During the pairing-season the old stags stalk about with erected tail, outstretched muzzle, and everted face-glands, and are by no means pleasant-looking animals, while in captivity, at any rate, they are positively dangerous.

With regard to sambar stalking, it is stated in the *Badminton Library* that "the sportsman should be on his ground just before daylight, and work slowly through the forest at the edge of the feeding-grounds, taking the bottom of the hill if there are crops on the plain below. Presently, if there are any sambar about, he will hear their trumpet-like call, and, creeping on, see two or three dark forms moving among the trees. . . . If the sportsman fails to intercept any stags on their return from their feeding-grounds by working along the base of the hill, he should next ascend the hill and try the cup-like basins which are so often found near the summits. . . . The above applies chiefly to the isolated hills which rise out of the plains in Central India; in ranges like the Siwaliks the best plan is to walk along the top of a ridge, examining the ravines below, and in the grass on the crest of these ridges will often be found places where sambar have been lying down under the trees, the 'form' being carefully chosen so that the shade of the tree will be over it during the hottest part of the day."

In some parts of India stalking sambar, or other species of deer, is unusually difficult, and in such spots driving is considered by some sportsmen admissible. In regard to this practice an article may be quoted from *The Asian* newspaper of 16th January 1900. After stating that when stalking is impossible, driving is permissible, the writer pertinently asks, Where is it impossible to stalk deer? "During a considerable experience," he writes, "extending from the Himalayas

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to Southern India, we have seen no such impossible ground, with the exception of parts of the Terai and Assam, where elephants are a necessity. The Himalayas, the Siwaliks, the Satpura hills of the Central Provinces, and the mountains of Southern India, all these afford ideal stalking ground, and driving for deer in their forests is inexcusable and unsportsmanlike. The ground may be difficult, steep, dangerous, and rocky; but where a deer can climb, a man can climb also. The jungle may be dense, and the foliage luxuriant, but the sportsman who is content to wander all day in the forest, rifle in hand, on the chance of obtaining a shot, accompanied only by one or two men, is sure to meet with ultimate success, although he will probably not bring to bag as many animals as the man who lurks behind a tree or rock, and has the game driven up to him.

“And it is in this that the gist of the matter lies. The real sportsman is ready to undertake any amount of labour in order to bring his game to bag, and the more trouble and pleasurable toil he expends in its pursuit the more does he value his quarry and the trophy it yields him, whilst he does not gauge success by numbers. But the other kind of hunter thinks only of killing his animal, and cares not in what manner it is slain, so long as it falls to his rifle, preferring that method of procedure which entails upon him the least possible trouble and exertion. A few miles’ drive or ride from camp or station; a comfortable place in the shade of a tree whilst the beat is being arranged; and a shot from ambush, perhaps at a few yards’ distance, at an unfortunate sambar, the whole process occupying a few hours—this is the acme of sport to the lazy man whose sole object is to shoot the game. . . . But the true sportsman scorns such methods; his pleasure is found in wandering over the hills and through the forest from daybreak to sunset, keeping every sense on the alert, and pitting his knowledge of wild animals and jungle-lore against the cunning of the denizens of the woods.”

THE MALAY SAMBAR

(Cervus unicolor equinus)

NATIVE NAMES.—See INDIAN SAMBAR

(PLATE VI. FIG. 5)

The representative of the sambar met with in Burma, as well as in Eastern Assam and Kachar, differs sufficiently from the typical form to be regarded as a local race, although not as a distinct species. Consequently, for the name of "Equine Deer," so frequently applied to this race, the title of Malay sambar is in all respects preferable, as serving to emphasise its specific identity with the Indian animal.

Nearly rivalling the latter in respect of bodily size, the Malay sambar usually has shorter and thicker antlers, in which the hinder or inner tine of the terminal fork is considerably inferior in length to the front or outer tine, while it springs as a kind of spur from the inner margin of the beam, of which the outer tine forms the direct continuation. The brow-tine, too, is in most instances of proportionately greater length. On the average, the general colour appears to be darker than in the Indian sambar, approaching to black or slaty grey in the old stags; there is frequently a light flesh-coloured ring round each eye, and the ears are relatively smaller, and often show a distinct whitish margin. In some cases, too, the lower portion of the legs show a tendency towards dirty white, and the tail seems to be decidedly more bushy than in the typical race. The fawns are foxy red in colour, with the upper surface of the tail and a line down the back black or blackish, and in many instances, although by no means invariably, they

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are more or less distinctly spotted on the hind-quarters. A spotted fawn was born at Woburn Abbey in January 1898.

Although typical antlers of this race are very distinct from those of the Indian sambar, there are examples in which the distinction is less clearly marked, these perhaps coming from the districts on the confines of the respective habitats of the two races. Antlers measuring



FIG. 40.—Frontlet and Antlers of Malay Sambar. From a Burmese specimen in the British Museum.

$30\frac{1}{8}$ and $29\frac{3}{8}$ inches in length, with respective basal girths of $4\frac{3}{8}$ and 6 inches, have been recorded.

The range of the Malay sambar apparently extends from Assam (probably eastward of the Bramaputra) into Burma, and so on to the Malay and other countries lying beyond the area to which the present volume is restricted.

THE PARA, OR HOG-DEER

(Cervus porcinus)

NATIVE NAMES.—*Para*, HINDUSTANI, SINDI, AND PUNJABI; *Dodar* IN ROHILCUND; *Khar laguna* IN THE NEPAL TERAİ; *Nutrini haran*, BENGALI; *Will-muha*, CINGALESE; *Darai* OR *Dayai*, BURMESE

(PLATE VII. FIG. 1)

The para is the smallest Indian representative of the rusine deer, its height at the shoulder commonly ranging between 25 and 29 inches. The general build of this pretty little species is low and heavy, with the legs and face comparatively short; and it is perhaps from this characteristic massiveness of make that its common title of hog-deer is derived. The antlers of the bucks, which in fully adult individuals are considerably longer than the head, are supported on relatively tall pedicles from the skull, and are fairly stout, although less rugose than in the sambar. The brow-tine is short, the beam of great length, and the hinder, or inner tine of the terminal fork somewhat shorter than the outer one.

The hairs on the back have pale tips, but are not banded with rings of different shades. Full-grown specimens in the winter dress are generally bright, shining rufous or yellowish brown in colour, somewhat speckled over with a lighter shade owing to the pale tips of the hairs, a marked peculiarity being that the hair on the lower surface of the body is considerably darker than that of the back. In the summer coat, on the other hand, the general tint is distinctly lighter, and, during at least the early portion of the season, a variable number of very pale brown or white spots make their appearance. In

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some individuals, as in the buck shown in the photogravure on page 219, the entire body is thus dappled; but in other instances the spotting may be restricted to a couple of rows on each side of the dark streak which runs down the middle line of the back. The ears, which are well covered with hair on the outer surface, and are white internally, are of rather large size; and the tail, of which the lower surface is white, is likewise proportionately long; the throat is devoid of the



FIG. 41.—Head of Male Hog-Deer. From a specimen in the possession of Mr. H. C. V. Hunter.

mane, which forms such a conspicuous feature in the sambar; the face-glands are proportionately much less developed than in the latter species; and the colour of the tufts of hair covering the metatarsal glands is decidedly lighter than that of the rest of the leg. Antlers measuring 21 and 20½ inches in length have been recorded, the longer pair having a basal girth of 3¼ inches.

Unlike the sambar, which is essentially a dweller in hill-forest, the para is an inhabitant of river-flats, in which it prefers tracts where the grass is of moderate height; but it is occasionally found in forest.

In India itself the species seems indeed to be restricted to the plains of the Indus and Ganges valley, its reported occurrence in the peninsula proper being unconfirmed. On this vast plain its range extends from Sind and the Punjab, through Assam and Sylhet, into Burma, its southern limit on this side of the Bay of Bengal being apparently Tenasserim. Its occurrence in Ceylon is due to importation by man.

Hog-deer live mainly by grazing, and are therefore admirably suited for turning out in parks, on account of not doing any damage to trees



FIG. 42.—Hog-Deer Stag in summer dress. From a photograph by the Duchess of Bedford.

and foliage. Numbers have been turned out by the Marquis d'Hervey at St. Denys, and by Monsieur Pays Mellier at Pataudière; and the species thrives well in the Duke of Bedford's park at Woburn.

The para is to a considerable extent a nocturnal animal, and since it dwells among grass which is generally of sufficient height to conceal its body, it is easy to see why it retains the relatively large ears of its relative the sambar. Unlike the latter, it is, however, an extremely unsociable species, never collecting in herds, and generally found solitary, except in the pairing-season, when two or three individuals go about together. The

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antlers are generally shed in April, the pairing-season takes place in September or October, and the fawns make their appearance in the following May or June.

Hog-deer are somewhat ugly movers, running with the head carried unusually low. They are frequently put up when pig-sticking on grass plains, and afford a good run. In Dera Dun and the sub-Himalayan Terai these deer are generally shot from elephants while beating large tracts of grass when larger game is not on the move. The does lie so close as almost to be kicked up by the feet of the elephants; but the bucks are more alert, and get up sooner, so that the best chance of shooting them is to ride on one flank somewhat in advance of the line of beating elephants, or to take up a position on foot in a place to which the deer are likely to bolt. To the novice shooting such comparatively small and quickly moving animals from elephant-back will be found by no means an easy matter.

A buck now living at Woburn Abbey apparently indicates the existence of an undescribed representative of the hog-deer in the Philippines.

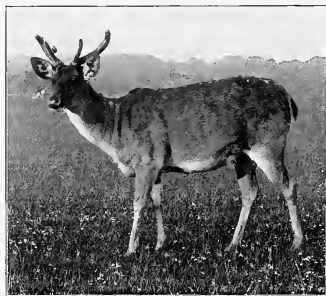


FIG. 43.—Swamp-Deer Stag, with the antlers in velvet. From a photograph by the Duchess of Bedford.

THE CHITAL, OR INDIAN SPOTTED DEER

(Cervus axis)

NATIVE NAMES.—*Chital*, *Chitra*, AND *Jhank*, HINDUSTANI; *Chatidah* IN BHAGALPUR; *Boro Khotiya*, BENGALI; *Buriyah* IN GORAKHPUR; *Lupi* AND *Kars* OF THE GONDS; *Darkar* OF THE KORKU; *Pusta* OF THE HO-KOL; *Sarung*, *Saraya*, *Jati*, AND *Mikka*, CANARESE; *Dupi*, TELEGU; *Pali-man*, TAMIL AND MALABARI; *Tic 'Muha*, CINGALESE

(PLATE VI. FIG. 6)

The sambar and the chital in India and the greater and lesser kudu in Somaliland offer a curious analogy in their respective habits, the sambar and the greater kudu inhabiting hill-forests, while the chital and the lesser kudu frequent for most part the lowlands, although the chital sometimes betakes itself to hilly ground. Both species of kudu are found in dense and often almost impenetrable thorn-jungle, and we accordingly find them furnished with enormous ears, capable of catching the largest possible amount of sound. They are probably also to a considerable extent nocturnal animals. The same is undoubtedly the case with the Indian sambar, which is likewise essentially a forest-dwelling animal, and the ears accordingly attain a relatively large size. On the other hand, in the chital, which is to a great extent a diurnal species frequenting more open country than the sambar, the ears are relatively small and narrow. The remarkable difference in coloration between the sambar and the chital may likewise in all probability be attributed to their widely different environment, the sombre hues of the former being calculated to afford protection in the obscurity of the forest, while the

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bright tints of the latter are more in harmony with the brilliancy of its inanimate surroundings.

By sportsmen this deer is commonly called axis, a name applied by Pliny (and adopted from him by Belon) to an Indian animal which there is every reason to believe is the present species, of which indeed it



FIG. 44.—Head of a Chital Stag.

forms the scientific title. For ordinary purposes it seems, however, far preferable to adopt the Hindustani name chital, of which Indian spotted deer is a somewhat expanded translation.

With the exception of a darker-coloured species from one of the islands of the Philippini group, the chital is the only one of the rusine deer which is spotted with white at all seasons of the year. Indeed it is,

with the above-named exception, the only deer that is as fully spotted in winter as in summer, fallow deer losing all their spots in the former season, when they also tend to more or less completely disappear in the Japanese deer and its larger relatives.

In size the chital may be described as medium, its height at the withers usually ranging between 36 and 38 inches. It has a rather long and pointed head, elongated limbs, and a generally light and gracefully built frame. There seems no marked seasonal difference in the colour of the coat, of which the general hue is light rufous fawn, marked all over



FIG. 45.—Chital Hind at Woburn Abbey. Photographed by the Duchess of Bedford.

the body with rather large and rounded spots, which tend to arrange themselves in longitudinal lines along the back and immediately above the white of the under surface of the body. A well-defined dark stripe runs from the nape of the neck to the tip of the tail, on either side of which the spots form at least one well-marked line. The chin, the upper part of the throat, the inner surface of the ears, the under parts of the body, the inner surface of the limbs, and the lower side of the tail, are of the same pure white as the spots. The head, which is darker on the face than elsewhere, is uniformly brown, and acquires a characteristic expression by the very general presence in the bucks of a blackish band across the muzzle just above the naked area. The antlers, which are

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supported on short pedicles, are long, slender, and moderately rugose. The rather long brow-tine is given off from the beam nearly at a right angle; the front or outer tine of the terminal fork considerably exceeds the hinder, or inner one in length, and forms the continuation of the line of the beam, from the inner side of which springs the hinder tine. The space enclosed between the two antlers is of a more or less distinctly lyrate form; and sports, or snags, are frequently given off near the point of origin of the brow-tine. The ears, as already mentioned, are moderate-sized and narrow; and the face-glands, of which the position is marked by tufts of reddish hairs, are likewise of medium development. The rather long and pointed tail is evenly haired throughout its length; and there is an equally marked absence of long hair on the neck and throat, this absence largely contributing to the generally neat appearance of the chital as contrasted with the sambar.

The longest chital antlers on record measure $38\frac{1}{4}$ inches in length along the outer curve, with a basal girth of $4\frac{3}{4}$ inches, and a tip-to-tip interval of $19\frac{1}{2}$ inches. Many examples ranging in length between 35 and $37\frac{1}{2}$ inches in length are known, among which the maximum tip-to-tip interval is $25\frac{1}{4}$ inches. Chital antlers, unlike those of the red deer group, attain their maximum complexity in the third year, after which they continue merely to increase in size (with the occasional addition of the aforesaid sports) year by year until the period of decline is attained.

Where chital and fallow deer are herded together in parks, the inexperienced observer may sometimes be puzzled to distinguish between the hinds of the two species when in the summer coat. The following points of distinction may accordingly be quoted, with some verbal alteration, from the *Gardens and Menagerie of the Zoological Society*, by Bennett. "In both," it is there written, "the colour of the back and sides is fawn spotted with white; a deep brown or blackish band occupies the middle line of the back; and an almost continuous white line passes along either

side of the belly between the limbs. But the head, which in the fallow deer is of a uniform greyish brown, is marked in the chital by a broad dusky spot on the forehead, and a line of the same colour extending along the middle of the nose. The chin and throat of the chital are pure white, while in the fallow deer they are of nearly the same colour with the chest and under surface of the body, which are both of a greyish hue. The buttocks of the fallow deer are occupied by a broad white patch, separated from the fawn of the back and sides by a black band; and the tail is black above and white beneath. In the chital the buttocks are of the same colour with the adjacent parts, and the tail is tawny above and white beneath, with a narrow blackish border towards the tip."

The chital is one of the most characteristic animals of India and Ceylon, to which countries it is absolutely confined, and where it is widely distributed. Quite unknown in the countries to the eastward of Bengal, and in Assam, it is likewise wanting in the open plains of Sind, the Punjab, and Western Rajputana, which are unsuited to its mode of life. Although to a great extent a plain-loving animal, it is found along the foot-ranges of the Himalaya from the neighbourhood of the Sutlej as far west as Nepal, but does not extend into Sikhim; on these outer hills it may be found as high as about 3500 or 4000 feet above sea-level in a few localities. It is common in the Bengal Sandarbans, as indeed it is in nearly all parts of India and Ceylon suitable to its habits; and in such localities it may almost be regarded as an integral component of Indian jungle-scenery.

From what has already been said, it will be inferred that the near neighbourhood of water is essential to the existence of this beautiful species; another requisite being the proximity of covert into which it can retire for repose. Chital are, perhaps, the most gregarious of all the Indian *Cervidae*, the herds frequently including hundreds of individuals, among which there is at least one master stag. As is the case with most animals

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associating in large herds, chital are to a considerable degree diurnal in their habits, feeding for several hours after sunrise, and being once more on the move some time before sundown. Where there is a sufficiency of covert, the neighbourhood of human habitations is no detriment to their presence, provided they are not too much fired at; and in such localities they frequently do much damage to standing crops of various descriptions. Bamboo-jungle, where there are open glades dotted with isolated clumps of the same plant, in the immediate vicinity of water, forms some of their favourite haunts. They both graze and browse, and are good swimmers, taking readily to the water. Their ordinary cry somewhat resembles a kind of bark, but they also utter a shrill alarm-scream. Although in India the greater number of the fawns appear to be dropped during the cold weather, many are born at other times of the year; and this implies a corresponding degree of irregularity in the shedding of the antlers, which apparently occurs in each buck at a time of year depending upon the season in which it was born. It is stated in the *Badminton Library* that the irregularity in the time of shedding the antlers is more marked along the foot of the Himalaya than in Central India, where the majority of the stags have these appendages free from the velvet in January, and shed them about July.

Chital are chiefly hunted by stalking; and, as mentioned in the volume cited, the sportsman's best chance of escaping detection when he comes unexpectedly on a herd, is to stand motionless, when, if suitably clothed, he may be mistaken for a tree-stump, whereas if he attempts to crouch down he will be immediately detected. This remark applies, of course, to other kinds of game.

Chital have been acclimatised for more than fifty years in some of the French and German parks; and the Duke of Bedford possesses a magnificent herd at Woburn Abbey, which are, however, kept in an enclosure.

The hinds of all species of deer are marvellously clever at concealing

their young ; but no better instance of this trait is on record than one that occurred among a small herd kept by Mr. W. H. Ravenscroft at Colombo, Ceylon, in 1883. One of the does had given birth to a fawn in a small enclosure near the house of its owner ; and on the second day after the birth she was seen quietly feeding, between four and five in the afternoon, but unaccompanied by the fawn. Mr. Ravenscroft, with half-a-dozen servants, entered the enclosure to search for the fawn. The ground within the enclosure, which was about a quarter of an acre in extent, and devoid of covert, except at one end, where there were a few cinnamon bushes and a single good-sized tree, was carefully examined, without any trace of the missing fawn. So, too, was an area of some extent outside the fence (through which it was thought the fawn might have crept), but with a similar negative result. Next morning the doe and fawn were seen together. A man was set to watch, who informed the owner that one afternoon he saw the pair go into the bushes, and the doe come out alone after a few minutes. It thus appeared that for eight or ten days the mother regularly put her offspring to bed about half-past four in the afternoon, and concealed it so successfully that although Mr. Ravenscroft knew within a few feet the place where it lay, he never succeeded in finding it.

It is well known that during the pairing-season red-deer stags occasionally get their antlers so locked together that the unfortunate animals are unable to extricate them, and thus perish miserably. It might have been thought that the simple form of the antlers of the chital would not lend themselves to such interlocking. But that this is not the case is proved by a pair of chital skulls picked up many years ago in the Central Provinces, in which the antlers are immovably locked together.

THE SWAMP-DEER, OR BARASINGHA

(Cervus duvauceli)

NATIVE NAMES.—*Barasingha* AND *Maha*, HINDUSTANI ; *Baraya*, *Gonr*, AND *Ghos* IN THE NEPAL TERAI ; *Jhinkar* IN THE KYARDA DUN ; *Goin*, SINDI ; *Goinjak* (male), *Gaoni* (female) IN CENTRAL INDIA ; *Bara-Nerwari*, AND *Sal-Samar* IN MANDLA ; *Bhelingi-pohu*, ASSAMESE

(PLATE VI. FIG. 7)

Were it not that the name is so frequently misapplied by English sportsmen to the Kashmir hangul, the Hindustani title *barasingha* (*anglicè*, twelve-tined) would undoubtedly be the best designation for the present species. But in view of this possible confusion it seems better to employ an English name, using *barasingha* merely as an alternative title ; and as the name *swamp-deer*, although not altogether free from objection, is in such general use, it seems, on the whole, to be the most convenient.

With the exception that it retains in most instances a line of whitish spots on each side of the dark dorsal streak, the *swamp-deer* is as uniformly coloured an animal as the *sambar*, and, like that species, exhibits no marked seasonal change in the colour of the coat. Indeed, this feature appears to be common to all the deer of both the *Rusine* and *Rucervine* groups ; the latter name being, by the way, the title of the group to which the present species and two other allied Oriental deer belong.

These *Rucervine* deer are perhaps best distinguished by the form of the antlers of the stags, which are more complex than those of the *sambar* group and at the same time very different from those of the *red deer* and its allies. Another, and perhaps equally important feature, is the absence or rudimental condition of the metatarsal gland and its tuft. As regards the

antlers, which may be either rounded or flattened, they lack both bez (second) and trez (third) tines, and have the beam forked (often symmetrically) at a variable distance above the origin of the brow-tine, and one or both



FIG. 46.—Head of Swamp-Deer Stag. From a specimen in the possession of Mr. H. C. V. Hunter.

branches of this fork again dividing at least once, so that the minimum number of points on each antler is four, while there are frequently six, and in some cases eight, or even more. Yet another feature of these appendages is that the brow-tine is either given off at a right angle to the main beam, or forms an uninterrupted continuation of the curvature of the latter.

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Although the fawns are more or less fully spotted, the coat of the adults is in most cases nearly uniformly coloured, and shows no large light rump-patch. The neck is slightly maned, the face is long, and the tail rather short. The face-glands attain only a moderate degree of development. The group is represented by three nearly allied species of relatively large-sized deer, one of which is restricted to India, while the second (*Cervus*



FIG. 47.—Swamp-Deer Stag, with the antlers in velvet. Photographed at Woburn Abbey by the Duchess of Bedford.

schomburgki) inhabits Northern Siam, and the third is found in Burma and other countries lying still farther east.

The swamp-deer is a somewhat stoutly built species, standing from about 3 feet 8 inches to 3 feet 10 inches at the withers. The muzzle is rather long and narrow ; and the hair of a moderate degree of fineness, and with a tendency towards a woolly nature. In the summer coat the general colour of the hair of the upper-parts is a bright rufous brown, frequently at least, with a broad brown streak, bordered on either side by a line of

whitish spots, running down the middle of the back, and with a less distinct trace of spotting on other parts. The throat, the inner surfaces of the thighs, and the under-parts generally are white or whitish, while the lower surface of the tail is always white. In winter, on the other hand, the general colour is yellowish brown, with the under-parts paler.



FIG. 48.—Head of Swamp-Deer Stag with antlers of an abnormal type. From the *Proceedings of the Zoological Society for 1899.*

The hinds at all seasons are somewhat lighter in colour than the stags ; and the fawns are spotted all over with white. The metatarsal gland is wanting.

In their typical form the antlers of the swamp-deer are very characteristic, and cannot possibly be mistaken for those of any other species. They are smooth and flattened, with the relatively long brow-tine springing from

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the beam almost at right angles. Above the point where this tine is given off the beam remains undivided for about half the total length of the antler, when it divides into a regular fork, of which both branches are of equal calibre, and each is usually simply forked, although the outer branch may considerably exceed the inner one in length, and may likewise carry three or more tines. Small supplemental snags are not unfrequently noticeable on the upper surface of the brow-tine, but that tine never forks, while "sports" at its junction with the beam are seldom seen.

Such is the typical form of antler characteristic of the swamp-deer, but among a series of remarkably fine heads recently obtained by Major C. B. Wood on the 5th January 1899 in the Central Provinces, the one shown in the figure on page 231 departs very widely from this type, while the others, although less markedly abnormal, likewise exhibited a variation in the same direction. In these antlers the brow-tine, which is very long and much curved, arises at more than a right angle from the beam, which is also much curved; so that a very little more and the two would form a continuous curve. The forking of the beam likewise occurs at a point much higher up than usual, and the inner or posterior branch of the fork is very much thinner and shorter than the outer or anterior branch, which curves forward in continuation of the line of the beam, and gives off two snags from its sharp hinder or upper surface, which are serially continuous with the small hinder branch of the main fork. In fact, the whole antler (especially on the left side, where the hinder branch of the main fork is not subdivided) is in many respects more like that of one race of the thamin than of a typical swamp-deer, this being especially shown by the nearly cylindrical shaft of the beam. Did all the swamp-deer from the Central Provinces present this peculiar type of antler, they would undoubtedly be entitled to rank as a distinct local race of the species; but the other specimens obtained by Major Wood indicate that this is not the case,

although, as already mentioned, they depart to a certain degree from the normal in the direction of the aberrant type.

A length of 41 inches, with a basal circumference of $5\frac{1}{2}$ inches is the "record" for swamp-deer antlers.

As already mentioned, the swamp-deer is absolutely restricted to the Indian mainland, being unknown in Ceylon, as well in the countries lying to the south of the Assam valley, which forms its limits in this direction. Westward the range of the species is continued along the foot of the Himalaya to the Kyarda Dun, beyond the Jumna. From the eastern Sandarbans of Bengal the swamp-deer is met with in a few localities in the Indo-Gangetic plain as far as Bahawalpur and Rohri in Sind, as well as locally through the great tract between the valleys of the Ganges and the Godaverī, as far eastwards as the Mandla district. It is likewise numerous in the upper portion of the valley of the Nerbada, as well as southwards to the neighbourhood of Bastar. In the Central Provinces the limits of the areas inhabited by this deer correspond to the tracts of sal-forest.

Avoiding thick forest, the swamp-deer, which subsists entirely by grazing, especially affects the outskirts of woods and open grassy plains with scattered trees; the vicinity of water being essential. In such localities these deer are found during the cooler months of the year in herds, which in some instances are of great extent. In the spring the members of these herds disperse; single stags being met with on the grass plains of Assam during March with their antlers in velvet. These deer are at least as diurnal in their habits as the chital; and the pairing-season appears to take place in the latter part of October.

Where the ground on which they are found, as in parts of Central India, is open, swamp-deer may be stalked; but in the high grass of the Nepal Terai and Assam they are more commonly shot from elephants.

THE THAMIN, OR ELD'S DEER

*(Cervus eldi)*NATIVE NAMES.—*Sangnai*, or *Sangrai*, MANIPURI ;*Thamin*, or *Thameng*, BURMESE

(PLATE VI. FIG. 8)

By the naturalists of the middle of the century the Thamin, or Burmese representative of the swamp-deer, was placed in a genus, or sub-genus, by itself, under the name of *Panolia* ; and is hence still sometimes spoken of (quite unjustifiably) as the “Panolia deer.” Its near relationship to the swamp-deer was, however, gradually recognised ; but it was not till the description of the above-mentioned abnormal examples of the latter species obtained by Major Wood that the extreme closeness of the relationship was fully realised. It is a somewhat remarkable fact that it was not till the year 1842 that the thamin was definitely made known to science, although there is a possibility that a specimen described five years previously may have belonged to the same species.

The thamin stands about 3 feet 9 inches in height at the shoulder, and has a coat of remarkably coarse hair, which becomes very shaggy in winter, when it forms a kind of mane on the throat of the stags. With the exception of Major Wood's specimen of the swamp-deer, which, as already mentioned, forms a kind of intermediate link in this respect, the thamin differs from all other deer by the peculiar curvature of the antlers. These are cylindrical and very rugose, with the long and much arched brow-tine forming the continuation of the curve of the beam, which is set at right angles to the pedicle ; consequently the entire antler is approximate bow-shaped. For the greater part of its length the beam remains undivided,

having at first a backwards, then an outwards, and finally a forwards curvature; but towards its termination it is simply forked, each fork corresponding to the main fork in typical antlers of the swamp-deer. In old animals the outer tine of the terminal fork is larger and more complex than the inner one; the number of terminal points varying from as few as two or three in a certain percentage of adults to at least eight or ten in many stags. In this respect, however, there is considerable local variation



FIG. 49.—Group of Burmese Thamin at Woburn Abbey. From a photograph by the Duchess of Bedford.

in the species. In the typical Burmese thamin (*Cervus eldi typicus*), for example, the antlers are cylindrical to their summits, with few or no additional points on the prongs of the main fork, and a very long brow-tine. On the other hand, in the Siamese thamin (*C. eldi platyceros*) the front or larger branch of the main fork is considerably flattened, and carries a large number of snags on its sharp hinder edge, and the brow-tine is relatively shorter. It is in this race that the antlers make such a remarkably close approximation to Major Wood's abnormal specimen of the swamp-deer. In both races one or more prominent snags are usually

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developed at the point of junction between the brow-tine and the beam, that is to say, immediately above the pedicle; and it is a very general feature of the species that the antlers of opposite sides are more or less unsymmetrical when compared with one another. In the typical Burmese thamin, which alone concerns us on the present occasion, the colour of the hair in the winter dress of the stags is uniformly dark brown above (occasionally with a few light spots near the middle line of the back) and white or whitish beneath; the throat-fringe, which sometimes shows a white gorget, is darker than the rest of the coat, and there is usually more or less of white on the chin, around the eyes, and on the margins of the ears. In summer the colour of the stags changes to fawn above and pale brown on the under-parts of the body. At all times the hinds are of a paler rufous fawn; and the very young fawns are usually spotted with white on the hind-quarters. The Siamese race of the thamin is more rufous-coloured, and also more or less distinctly spotted at all seasons of the year. In general bodily form thamin are very like swamp-deer, having the same short tail; but more or less distinct traces are retained of the metatarsal gland and tuft.

The thamin, within the area treated of in the present volume, is found on all the flat alluvial tracts of the countries to the east of the Bay of Bengal, ranging from Manipur through Burma and Tenasserim into the Malay Peninsula. Since the swamp-deer takes its place in Assam, the confines of that district and Manipur would be the district where annectant forms between the two species, like Major Wood's Jabalpur specimen of the former, would be naturally expected to occur; and the attention of sportsmen should accordingly be directed towards the representatives of these deer in the districts in question.

The largest pair of thamin antlers recorded by Mr. Rowland Ward measure 42 inches along the outer curve (exclusive of the brow-tine), with a basal circumference of 5, a tip-to-tip interval of 29, and a maximum

width inside of 24 inches. The corresponding dimensions of the second largest specimen are 41, $5\frac{1}{2}$, $27\frac{5}{8}$, and 36 inches. Both specimens came from Burma, the former having two points on one side and three on the other, while the latter has five in both antlers.

As we gather from the well-known account given by Captain Beavan thamin are very similar in their general mode of life to swamp-deer, congregating for at least a portion of the year in large herds, and restricting their wanderings to low, flat country, where they at all times avoid thick forest and dense bush-jungle, although frequently resorting to open tree-jungle. To a great extent they are grazing animals, feeding largely on wild rice; but they also browse on the leaves of certain kinds of trees. When disturbed, the hinds give vent to a kind of barking grunt, but the cry of the stags is a louder and longer sound of the same nature. The pairing-season lasts from the middle of March to the middle of May, and the fawns, of which there is but one at a birth, are dropped in October and November, when they find abundant shelter among the wild rice, which is then at its full height. The fawn often remains with the hind till its second year. In Manipur the stags begin to drop their antlers in June, although in Lower Burma the period of shedding these appendages is deferred till the latter part of August or beginning of September. During the dry season, which lasts from the middle of February till the latter part of April, they betake themselves to the salt-swamps, and, save for the abundant dews at night, must apparently exist without fresh water.

In Upper Burma, where they are said to be comparatively scarce, thamin are commonly driven by means of lines of beaters, but in Lower Burma they are sometimes shot, in the native fashion, with the aid of lanterns at night. In addition to the sportsman and his rifle-coolies, the party on such an expedition includes a lantern-carrier and a man with bells and rings on a stick. On arrival at the spot selected for operations, a fire is kindled after dark, and a kind of incantation ceremony performed, in the

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course of which the various members of the party, together with the rifles, should pass through the smoke. The lantern, which consists of an earthenware pot with a hole in one side, and is used as a search-light, is then lit, the bells are jingled, and on the approach of a stag, the light is turned full in its eyes, by which it becomes so dazed as to offer an easy shot.

THE INDIAN MUNTJAC

(*Cervulus muntjac*)

NATIVE NAMES.—*Kakar*, HINDUSTANI; *Ratwa*, NEPALESE; *Karsiar* OF THE BHOTIAS; *Sikku* OF THE LEPCHAS; *Maya*, BENGALI; *Gutra* (male), *Gutri* (female) AND *Bherki* OF THE GONDS; *Bekra* AND *Bekar*, MAHRATHI; *Kankari*, *Kard-kari*, *Kond-kari* AND *Chali*, CANARESE; *Kuka-gori*, TELEGU; *Kalai* AND *Katu-ardu*, TAMIL; *Weli* AND *Hulamuha*, CINGALESE; *Hugeri*, ASSAMESE; *Gyi*, BURMESE; *Kidang*, MALAY, *Jangli-bakri*, COMMONLY IN SOUTHERN INDIA

(PLATE VII. FIG. 2)

Although the term “muntjac” is one in regard to whose origin the writer has no clue (it was used by the German naturalist Zimmermann so long ago as the year 1780 as the specific name of the present species), it is so convenient a designation for the small deer of the genus *Cervulus*, since it serves to mark their distinctness from the members of the genus *Cervus*, that its retention certainly seems advisable. Some writers, apparently basing their objection on the fact that muntjac is not the native name of any one species of the group, prefer the title rib-faced deer, or barking deer, but such a designation fails to emphasise the essential structural



6.



1.



5.



8.



7.



2.



3.



4.



PLATE VII

- | | |
|-------------------------|-----------------------|
| 1. Hog-Deer. | 5. Musk-Deer. |
| 2. Indian Muntjac. | 6. Indian Chevrotain. |
| 3. Tenasserim Muntjac. | 7. Indian Wild Boar. |
| 4. Tibetan Tufted Deer. | 8. Pigmy Hog. |

REPORT

1. The purpose of this report is to provide a comprehensive overview of the project's progress and results. The report is organized into several sections, each detailing a specific aspect of the project.

2. The first section, titled "Introduction," provides a brief overview of the project's goals and objectives. It also discusses the scope of the project and the methods used to collect and analyze data.

3. The second section, titled "Methods," describes the various techniques and tools used in the project. This includes a detailed discussion of the data collection process, as well as the statistical methods used to analyze the data.

4. The third section, titled "Results," presents the findings of the project. This section includes a series of tables and graphs that illustrate the data collected and the results of the analysis.

5. The fourth section, titled "Discussion," provides a detailed analysis of the results. It discusses the implications of the findings and compares them to previous research in the field.

6. The final section, titled "Conclusion," summarizes the project's findings and provides recommendations for future research. It also discusses the limitations of the study and the potential for further exploration.

difference between the members of the present group and the more typical deer.

Muntjacs, then, are small species of the deer tribe inhabiting India and some of the neighbouring countries, easily recognised by the peculiar structure of the skull and antlers of the bucks. The antlers, which do not normally exceed half the length of the head, are two-pointed, and consist of a very short brow-tine, and a beam, of which the tip is inclined inwards; the two elements forming an acute angle at their junction. These antlers are supported on long and slender bony-pedicles, often but little shorter than the antlers themselves, and frequently longer; the pedicles being continued downwards on the forehead of the skull as sharp ridges, converging towards the middle line as they descend, but never actually meeting. In the does tufts of bristly hair and short prominences mark the position occupied by the pedicles of the antlers in the bucks. With advancing age the pedicles of the antlers of the bucks become much shorter and at the same time thicker than they are in youth, when they are sometimes longer than the skull. The typical members of the group have a gland in the skin of the forehead situated on the inner side of each of the supporting ridges of the antler-pedicles; and the face-glands beneath the eyes common to other deer are likewise well developed. On the other hand, the metatarsal glands and their tufts are invariably wanting. A more important feature is the large size of the upper tusks of the bucks, which project beyond the level of the upper lip, although they do not grow from persistent pulps.

The common Indian muntjac, kakar, or barking deer, as it is indifferently called, is the typical representative of the group, and is a small, reddish-coloured animal, standing from about 20 to 22 inches in height at the withers. It has a relatively short tail, comparatively short and fine hair, and no tuft of bristly hairs on the crown of the head between the pedicles of the antlers. In the adult buck the general colour of the coat

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(apparently at all seasons) is uniform foxy or chestnut red, becoming darker than elsewhere along the back, and paler on the lower surface of the body. The face and limbs are brownish; and a distinct black line runs down the inner side of the pedicles of the antlers, to be continued for some distance down their supporting ridges on the forehead. The chin, the upper portion of the throat, the hinder part of the abdomen, and the inner side of the thighs, together with the lower surface of the tail, are white; and there is a small whitish mark above the hoof on the front surface of each leg. Females are coloured practically the same as males, with the exception that tufts of bristly black hairs mark the position of the antler-pedicles of the latter. The fawns are spotted.

The writer has seen several examples of very dark-coloured muntjacs, in which the back was nearly black, and the rest of the hair very dark brown. A skin of this type, obtained near Darjiling, at an elevation of about 5000 feet, was recently brought home by Mr. M. G. Jukes. And Mr. C. Hose has informed the writer that such dark-coloured muntjacs are not uncommon in some of the mountainous districts of North Borneo. This abnormal coloration would therefore seem to be an instance of the melanism frequently met with among animals inhabiting subtropical mountain forests, and cannot be regarded as indicative of a distinct local race. A pair of these dark-coloured muntjacs are now living at Woburn Abbey.

Indian muntjac antlers seldom exceed $6\frac{1}{2}$ inches in length, with the brow-tine only about $1\frac{1}{2}$ inches; but a specimen from Mussuri measures $7\frac{1}{2}$ inches in length, and an exceptionally long pair from Java rather more than 10 inches. Recently (1899) Mr. R. E. Holding has, however, figured in the *Proceedings of the Zoological Society of London* a remarkable frontlet and antlers of a small deer obtained among a cargo of horns imported into London for commercial purposes. Although the pedicles are proportionally much shorter, and the antlers themselves larger and heavier than in

any other examples that have come under the writer's notice, and the brow-tine $4\frac{3}{4}$ inches in length, while the pedicles have a circumference of $3\frac{1}{2}$ inches. That this specimen is really Cervuline is demonstrated by the frontlet and antlers shown in the annexed cut, which were obtained by Mr. Charles Hose at Pahang, in the Malay Peninsula, and presented by him to the British Museum. Although somewhat smaller than Mr. Holding's example (the length of the antlers being 7 inches), they indicate without doubt the Cervuline nature of the latter, as the rib-like ridges on the forehead are preserved, and at the same time suggest the Malay origin of that specimen. The antlers are noticeable for their marked lateral compression and consequent great antero-posterior depth. Both specimens belong to very old animals.

As already stated, the writer is unacquainted with any Indian muntjac antlers rivalling these two specimens in size; and it would consequently seem not unlikely that the Malay animal may indicate a distinct race. But if the muntjac from the Malay Peninsula were

separated as a distinct race, it would be no longer possible to regard the Bornean muntjac as identical with the Indian; and such a subdivision of the species seems at present inadvisable. Consequently, a separate name is not assigned to the animal represented by the large Malay antlers; although, as noted below, Malay muntjacs are known to run larger than those from India.



FIG. 50.—Frontlet and Antlers of a very large Muntjac. From Pahang, in the Malay Peninsula.

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The Indian muntjac, as its name implies, is typically an inhabitant of Hindustan, where it ranges from the outer Himalaya to Cape Comorin. It is also found in Ceylon, and from India extends eastwards through Arracan and Burma into the Malay Peninsula, and so onwards to the Malay Islands and the sea-board of China. From the observations of the late Sir Victor Brooke, it appears that muntjac from the south of India run smaller than those from the more northerly districts; while, on the other hand, those from the Malay Peninsula and Islands are as noticeably larger. Although it is quite probable that the species may eventually be found divisible into local races, the present is neither the time nor the place for the discussion of such an intricate question, which has, indeed, little or no interest for the ordinary sportsman.

Like the majority of the smaller representatives of the deer tribe, the muntjac is an unsociable creature, passing the greater portion of its time in solitude, although seeking the society of a mate during the pairing-season. Seldom are more than a pair seen in company, although three, and even four, have been observed together. Muntjac only leave the thick covert among which they habitually dwell for the sake of drinking or of feeding on the grass of the adjacent glades; and as they are strictly nocturnal, they are scarcely ever seen except when driven from their retreats. When walking quickly, muntjac move their limbs in a peculiarly stilted and deliberate manner; but, when running, scuttle along with the head carried low and the hind-quarters elevated, the same mode of progress being followed when creeping through thick covert.

In India the antlers of the bucks are annually dropped in May and renewed in August. The pairing-season in the more northern districts of the country takes place in January and February for the most part; and when such is the case, the fawns, of which either one or two may make their appearance at a time, are dropped in July or August. In other districts there seems, however, to be no regular pairing-

season, and the fawns may consequently be produced at any time of the year.

The hoarse, bark-like cry, from which the name kakar is probably derived, is uttered not only by the bucks in pairing-time, but, under the influence of alarm, at any season of the year ; during the pairing-time it is most commonly heard in the morning and evening, although occasionally it may startle the traveller after darkness has fallen. During their contests with one another the bucks appear to rely upon their long upper tusks, rather than upon their antlers. In spite of their tendency to coarse feeding, at any rate when kept in confinement, muntjac yield a venison far superior to that of most other Indian deer.

The present writer has tried to shoot kakar by having the jungles on a hill-side beaten ; but since these little deer are solitary, it is but seldom that they come near the sportsman, if there be only a single gun in the field, consequently the sport is by no means of an exciting or satisfactory description. In places where they are sufficiently numerous to afford a certain number of shots, the best plan is to walk them up in covert when they are on the feed in the evening or the early morning.

Muntjac have long been acclimatised in France ; at Rambouillet they survived the severe winter of 1879-80 with only the shelter of an open shed, and in the daytime might be seen lying out on the snow. They run wild in the Duke of Bedford's coverts at Woburn Abbey.

THE TIBETAN MUNTJAC

(*Cervulus lachrymans*)

Since this species is very closely allied to the last, and occurs in districts where but few European sportsmen penetrate, a very few words in regard to it will suffice. In size it is somewhat inferior to the Indian

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muntjac, standing only 19 inches at the shoulder. Having the same face-markings as the latter, it is distinguished by a difference in the general colour of the fur, which is bright rufous brown, with the hairs on the back speckled, the head and neck being yellowish brown.

This muntjac was first discovered in Moupin, Eastern Tibet, whence its range extends into some of the neighbouring districts of China.

THE TENASSERIM MUNTJAC

(*Cervulus fœæ*)

(PLATE VII. FIG. 3)

Very different to both the preceding species is the rare Tenasserim muntjac, in which the general colour, instead of being some shade of chestnut, is sepia-brown, while the tail, which is comparatively short, is black above and white below. It agrees, however, with the Indian muntjac in the absence of a tuft of hair between the pedicles of the antlers. The upper part of the face is very brilliantly coloured, being bright yellow from above the level of the eyes, with the exception of a black V running along the inner borders of the face-ridges to terminate on the brown of the nose. The front surfaces of the thighs are conspicuously marked with a pure white line. Unlike the Indian muntjac, this species has no gland on the forehead.

At present this muntjac is known only by a single male example, obtained about twelve years ago in the mountains to the south-east of Maleyit, in Tenasserim, and now preserved in the Museum at Genoa. In many respects it forms a connecting link between the hairy-fronted muntjac (*C. crinifrons*) of Eastern China, which is a larger plum-coloured species, distinguished by a crest of long coarse hairs on the crown of the head, almost completely concealing the pedicles of the antlers.

THE TIBETAN TUFTED DEER

(Elaphodus cephalophus)

(PLATE VII. FIG. 4)

The two species of tufted deer, of which the present alone comes within the purview of this volume, are closely connected with the muntjacs by means of the hairy-fronted species to which a passing reference has just been made. They derive their title of tufted deer from the crest of long and dense bristly hair crowning the summit of the head; while their scientific name of *Elaphodus* bears witness to the development of long sabre-like tusks in the upper jaw of the bucks. As these two latter features are common to the hairy-fronted, or (as it might preferably be called) crested muntjac, while the very short antlers are similarly supported on long ridges, the reader may well ask why these little deer are separated from the genus *Cervulus*. To this question it may be replied that, although the difference between *Cervulus* and *Elaphodus* is not very great, yet the two representatives of the latter are distinguished from the former by the circumstance that the pedicles of the antlers diverge inferiorly instead of converging, while they are not continued down the face as ridges, so that the name of rib-faced deer would be inapplicable to the present species. Moreover, the tips of the tusks of the bucks are not turned outward in the fashion observable in the muntjacs, while the hair is characterised by its extreme coarseness, being also relatively long. The fawns differ from those of the chestnut-coloured muntjacs in being spotted only along the middle line of the back; but since the young of the plum-coloured muntjacs are unknown, this character cannot at present be regarded as one of generic importance. The tufted deer have broad and

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rounded ears, of which the outer surface is thickly haired, and a tail of moderate length.

The Tibetan species may be compared in size to the Indian muntjac, standing about 22 or 23 inches at the withers. Its general colour may be described as deep chocolate brown, the hairs on the fore part of the body having brown tips with a white ring below, whereas farther back this white ring is absent. Consequently the region of the shoulders is finely



FIG. 51.—Head of Immature Male of Michie's Tufted Deer. From A. H. Garrod,
Proc. Zool. Soc. London, 1876.

speckled, but the hind-quarters are uniformly coloured. The crest forms a nearly black horse-shoe on the forehead, bordered above each eye by a line of grey; the ears show a large amount of white internally and on the inner margin, and the lower surface of the tail and the inner sides of the thighs and buttocks are likewise white.

This pretty little deer inhabits the mountains of Moupin, in Eastern Tibet, but is replaced in the east of China by a closely allied species, of which the head is shown in the accompanying cut.

THE KASTURA, OR HIMALAYAN MUSK-DEER

(Moschus moschiferus)

NATIVE NAMES.—*Kastura* AND *Mushk*, HINDUSTANI; *Raos* OR *Rons*, KASHMIRI; *La* AND *Lawa*, TIBETAN; *Ribjo*, LADAKI; *Bena* AND *Masakneba* IN GARHWAL AND KUMAON

(PLATE VII. FIG. 5)

As the animal of which we have now to treat is very different from all true deer, and is indeed only admitted within the family *Cervidæ* on sufferance, it would be much better if it were called either by its Hindustani name of *kastura*, or simply musk, dropping altogether the affix "deer." But custom is hard to overcome, and since the name musk-deer is current among all sportsmen, as well as among most naturalists, it would be a hopeless task to attempt its abbreviation.

From all the species of true deer mentioned in the present volume the musk-deer differs by the absence of antlers in both sexes; but as a similar feature also obtains in the case of the Chinese water-deer, this alone would not suffice to differentiate this animal from the other members of the family *Cervidæ*. As a matter of fact, the important structural features by which the musk-deer is so broadly separated from the latter are chiefly connected with the skeleton and the soft internal organs, and detailed reference to them would be out of place on the present occasion. It must accordingly suffice to say that such structural differences do exist, among them being the presence of a gall-bladder, which is never developed in the true deer.

As regards general appearance the musk-deer might be taken, if its long tusks be disregarded, for a female antelope just as well as for a female

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deer ; but the sabre-like upper tusks of the bucks are a feature quite unparalleled among the hollow-horned ruminants. In the extremely large size of the lateral hoofs of each foot, which are capable of being spread out so as to secure an additional foothold, the animal is quite peculiar.

In build the musk-deer is stout and heavy, if not actually clumsy, the rump being raised considerably above the level of the fore-quarters, while the hind limbs are considerably longer than the front pair, which, however, are also of considerable length ; both pairs are very thick. The coarse and thick hair, which is minutely waved, is remarkable for its extremely brittle and pith-like character, and must serve as a most efficient protection against the severe cold of many parts of the animal's habitat. The ears are of large size ; and although in the females of much smaller dimensions, the upper tusks attain a great development in the bucks, and form really beautiful objects. From all other members of the *Cervide* musk-deer differ by the absence of face-glands below the eyes ; and the metatarsal and tarsal glands found in so many deer are likewise wanting in these animals. In both sexes the tail is reduced to a mere glandular rudiment ; but whereas in the bucks it terminates in a small tuft, in the does it is covered uniformly with hair. A peculiar gland in the skin of the abdomen of the bucks secretes, at least during the pairing-season, the well-known powerful scent from which the animal derives its name.

In height the musk-deer stands some 22 inches at the rump, and about a couple of inches less at the withers. On the upper part of the head and body and outer surface of the limbs the prevailing colour of the fur is some shade of a rich dark brown, more or less mottled and speckled with grey, and in immature individuals displaying traces of spots, generally arranged in longitudinal lines. The speckled appearance of the coat is due to the peculiar coloration of the individual hairs, which are white for the basal three-quarters of their length, then ringed with white, and terminate in a

blackish tip. The under surface of the body and the inner sides of the limbs are whitish, and there may be a single or double white spot on each side of the throat. But in regard to details of coloration there is a considerable amount of individual variation, some skins being paler and others more yellow than ordinary; and in addition to all this there may be splashes of black or golden red on the upper parts, while the abdominal surface of the body may be either golden yellow or pure white.



FIG. 52.—Young Musk-Deer. From a photograph by the Duchess of Bedford.

Being essentially a forest-dwelling mountain animal, the musk-deer is restricted in the Himalaya to the wooded ranges, where it is usually found at elevations of about 8000 feet, or higher, during the summer months. So far as present information goes, the western limit of the range of the musk-deer occurs somewhere about the neighbourhood of Gilgit; it is unknown in the barren districts of Dras, Zaskar, and Ladak, but farther east, probably in the neighbourhood of Sikkim, extends northwards into

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the forest districts of Eastern Tibet. It has also a wide distribution in Central and Northern Asia.

The musk-deer, like the African elephant and the Greenland whale, is one of those unhappy animals yielding a product valuable to man, which can be obtained from no other source. And it is consequently an object of eager and incessant pursuit, which would in all probability have already resulted in its extermination, were it not for the fortunate circumstance that it frequents a kind of country where concealment is a comparatively easy matter. As it is, however, the numbers of this very curious animal have been very seriously reduced of late years in the more accessible parts of its habitat; although the enactment of game-laws in certain districts may, it is to be hoped, do something towards its rehabilitation. The contents of a "pod" of musk weigh about one ounce.

In wandering among the birch-forests which clothe the mountains of Kashmir for a certain height above the belt of pines, especially in early spring, when the snow still lies deep between the silvery stems, the traveller will from time to time be startled by a little animal of the size of a roe getting up suddenly at no great distance away, and starting off in a series of enormous bounds, after having taken from ten to twenty of which it will turn round to gaze at the disturber of its haunts—a habit which too often leads to its destruction. The creature that has thus bounded off is a musk-deer, which has either been gathering a meal from the dead grass buried beneath the snow or the lichens growing on the surrounding tree-stems, or has been sleeping in its "form." For musk-deer, like hares, appear to have regular resting-places, in which they lie up for the greater part of the day, being mainly nocturnal in their habits. Although the birch-forests and the higher portion of the pine-zone form their principal haunts in the Kashmir district, they may be seen farther eastwards at considerably lower levels, at times even among the rhododendron-forests, which in early spring clothe the sides of many of the outer Himalayan valleys with a brilliant

blaze of colour. It was at a comparatively low level in the valley of the Chinab that the present writer shot a musk-deer, whose skeleton is now mounted in the Anatomical Museum at Cambridge, this particular animal, by the way, having been feeding in the open in the early afternoon.

The musk-deer appears enabled to maintain a firm foothold on smooth and slippery boulders or faces of rock by means of the peculiar conformation of its hoofs, which are quite unlike those of any other living ruminant. As already mentioned, the lateral hoofs, which are more or less completely rudimentary in most other members of the group (if indeed they be not altogether wanting, as in the pala antelope and the giraffe), in the musk-deer vie in length and mobility with the main pair; and it would seem that by widely spreading the lateral hoofs a grasp of the surface of the rock is obtained. These extra large lateral hoofs also appear to act as a kind of break, by preventing the animal from slipping when descending a frozen snow-slope, or an inclined face of smooth rock. In the fore-legs the toe-bones supporting these lateral hoofs are supplied with special muscles and tendons which have become aborted by disuse in most other members of the ruminant group.

The food of the musk-deer varies, it seems, to a considerable extent according to the season of the year, probably including dried grass and lichens during the winter, and leaves of trees and flowers in summer. When wounded or captured musk-deer will often utter piercing screams at the critical moment, but under ordinary circumstances they are comparatively silent creatures, although giving vent sometimes to loud hisses as they stand gazing in astonishment on an intruder into their lonely and silent domains.

For the greater part of the year musk-deer are solitary, but in January the buck seeks the company of a single doe, with whom it remains during the pairing-season. In June the fawns make their appearance in the world; and although one is the usual number at a birth, there are occasionally twins. In this respect the musk-deer is very unlike the Chinese water-

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deer, which is likewise a small species devoid of antlers and with long upper tusks in the males; the number of young produced by the doe of the latter being, it is said, frequently as many as half-a-dozen at a birth. As some compensation for the limited number of fawns produced by each individual doe, the fawns themselves arrive at maturity very rapidly, and are capable of reproducing their kind within their first year.

Sportsmen are in the habit of estimating the fineness of the musk-deer they shoot by the length of their tusks. In the largest specimen on record the tusk projects $3\frac{1}{4}$ inches beyond the jaw-bone; while two examples are known in which the length is 3 inches. Here it may be mentioned that the only apparent difference between the sexes when seen in the field is the presence of the long upper tusks in the males, and to recognise the absence or presence of these weapons in a momentary glance requires some degree of practice on the part of the sportsman. With these weapons the bucks engage in fierce combats with one another during the pairing-season, specimens being sometimes killed in which the hair has been ripped off in long lines. The extreme brittleness and stiffness of the hair of these animals renders their pelts of but little value, although from the peculiar nature of the fur their cold-resisting powers must be very great.

In musk-deer shooting the usual plan is to walk up to the game, when either a small-bore rifle or a shot-gun may be used. Less sportsman-like is the method of driving; while the plan followed by the natives of Gurhwal of catching them by means of long net-fences provided at intervals with gaps in which are set running nooses is to be deprecated from all points of view.

Possibly, when large sets of specimens are available for exact comparison the Himalayan musk may be found divisible into local races, the form inhabiting Kansu having already been separated as a distinct species (*M. sifanicus*). A skull in the British Museum indicates that the range of musk-deer extends as far east as Amurland.

THE INDIAN SPOTTED CHEVROTAIN

(Tragulus meminna)

NATIVE NAMES.—*Pisura*, *Pisora*, AND *Pisai*, HINDUSTANI AND MAHRATHI ;
Jitrai-haran, BENGALI ; *Gandwa*, URIA ; *Yar*, HO-KOL ; *Kuru-pandi*,
TELEGU ; *Kuram-pami*, TAMIL ; *Kur-pandi*, CANARESE ; *Walmaha*,
CINGALESE

(PLATE VII. FIG. 6)

Among all the errors of popular natural history none is more persistent or more difficult to eradicate than the belief that the elegant little animals commonly known as mouse-deer, but preferably designated chevrotains, are really members of the deer tribe, or *Cervidæ*. And, after all, these little creatures are really very like diminutive hornless deer, such as the Chinese water-deer and the musk-deer. But superficial resemblances are not always to be trusted in zoology, as is well exemplified in the case of swallows and swifts, which, although outwardly so similar, are widely sundered from one another. And when we come to examine the anatomy of the chevrotains, we find many important features by which they are distinguished from the more typical ruminants, such as the deer.

It is true that they have no upper front teeth, and that they ruminate, or “chew the cud,” and also that their stomachs are divided into compartments. But these compartments are three instead of four in number ; and the smaller bone of the second segment of the hind limb, known as the fibula, is complete and quite free from the larger bone, or tibia, instead of being incomplete and more or less united with the latter. All the bones of the lateral toes are likewise complete, whereas some of them are imperfect or even wanting in the true ruminants. Moreover, if the ankle-joint be examined, it will be found to contain one bone more than in the latter

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group, in which two of the original elements are fused together. In the structure of their cheek-teeth they resemble, however, the true ruminants, as they do in possessing "cannon-bones," although in the African genus *Dorcatherium* it is only in one pair of limbs that the two component elements unite to form a cannon-bone.

All the Oriental chevrotains are small and delicately built animals, with elevated hind-quarters, and limbs so slender that it seems almost a marvel the bones are not fractured during rapid motion. They all inhabit forests, and are of shy and skulking habits. From their larger African relative they are specially distinguished by having cannon-bones in both fore and hind limbs. The head is long and pointed, with comparatively small and rounded ears, a large portion of the narrow muzzle bare and moist, and no glands below the eyes, glands being likewise wanting between the hoofs and in the groin. There are no appendages comparable either to horns or antlers, but the males, like those of the musk-deer and the Chinese water-deer, are furnished with relatively long sabre-like tusks, capable of inflicting severe wounds in their combats with one another. The tail is more or less short, the hair is fine and close, and the females are provided with four teats. In walking the chevrotains have a peculiar stilted gait, treading only on the tips of the hoofs, the legs having such a rigid appearance that it is a common idea there are no joints to the knees.

The Indian species is specially distinguished by being spotted and streaked with white, as well as by the chin and throat being completely covered with hair, instead of possessing a large bare glandular area; the tail, too, is much shorter than in the other species, and there is only a very small bare patch on the hind-leg in the immediate neighbourhood of the hock. In height the animal stands from about 10 to 12 inches at the shoulder; the length from the nose to the root of the tail varies from 18 to 22 inches, the tail itself measuring only an inch, or an inch and a quarter; the weight is from five to six pounds. In colour the upper-parts are a rich brown

(darker in some individuals than in others), finely speckled with yellow, the individual hairs being brown at the roots and black at the tips, below which they are ringed with yellow, thus causing the speckled appearance of the coat. The sides of the body, from the shoulder to the rump, are prettily marked with longitudinal rows of white or buff spots, which tend to form streaks about half-way down; and the inner surface of the ears, a streak above each eye, three broad stripes on the throat and chest, together with the whole of the under-parts, are pure white.

According to Mr. Blanford, the range of this chevrotain is limited to the forests of Ceylon and Southern India at elevations not exceeding about 2000 feet above the sea, its northern extension including Orissa, Chutia Nagpur, the eastern division of the Central Provinces, and the Western Ghats to the northward of Bombay. Its reported occurrence farther north requires confirmation. The animal is evidently a member of the typical Malay fauna; and the group, as is attested by the occurrence of fossilised remains of extinct species in the sub-Himalaya, must have existed in Northern India at a time when Ceylon formed a portion of the peninsula.

I have been unable to find the origin of the name *Meminna*, which is the specific title of this animal, since it is not given as one of its native appellations. It is, however, evidently of great antiquity, since Robert Knox, whose work on Ceylon was published during the reign of Charles II., writes as follows:—"Deer are in great abundance in the woods, from the largeness of a cow to the smallness of a hare, for there is a creature in this land no bigger than the latter, though every part rightly resembleth a deer; it is called *Meminna*, of a grey colour, with white spots and good meat." Although now commonly known by Europeans as the mouse-deer, Sir Emerson Tennent states that in his time it was called "moose-deer" in Ceylon, "moose" being probably a corruption of the Dutch word *mujs*, equivalent to mouse. He likewise suggests that the title musk-deer, by which these animals are also known, is traceable to the same origin, but it

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seems much more probable that it was given from their superficial resemblance to the true musk-deer. Sir Emerson also mentions that in 1847 he saw in Ceylon a pure white chevrotain, but whether or no this was a true albino is not stated.

In Central India the chevrotain takes up its abode among jungly rocks, from which it never ventures out into the open, and in the crevices of which it spends the hot mid-day hours, and in due season produces its young. Consequently it is but seldom seen, and when encountered at once makes for its rocky haven. The young, of which there are generally couplets, are wonderfully beautiful little creatures, so delicate and fragile that they seem scarcely fitted to endure the hardships of the world. They are born towards the end of the rainy season, or the commencement of the cool season; the males consort with their partners only during the pairing-season, which takes place about June or July, spending the rest of the year by themselves. Both sexes feed in the evenings and early mornings, and the only sound they are known to utter is described as a feeble bleat.

As they carry no trophies worth talking about, chevrotain offer but little attraction to the sportsman. They may be killed either with a shotgun or the rook-rifle.

THE NAPU CHEVROTAIN

(*Tragulus napu*)

NATIVE NAME.—*Napu*, MALAY

In common with its smaller Malay relative, the napu, or larger Malay chevrotain, is easily distinguished from the Indian species by its uniformly coloured body, and the presence of a large naked glandular area on the throat, as well as of another extensive bare tract on the hinder surface of each hind-leg in the neighbourhood of the hock; the tail, too, is much

longer, measuring about 3 inches. In height the animal stands about 13 inches at the shoulder, the length to the root of the tail being about 28 inches. The general colour of the upper-parts is yellowish or rufous brown, becoming greyer on the flanks, the tail being brown above and white below. A distinctive feature is the presence of *five* white bands on the throat and chest, of which one is median, while the other four form oblique lateral pairs.

The geographical range of the napu extends from the southern districts of Tenasserim through the Malay Peninsula to the islands of Java, Sumatra, and Borneo.

THE KANCHIL CHEVROTAIN

(*Tragulus javanicus*)

NATIVE NAMES.—*Yun*, BURMESE ; *Kanchil*, MALAY

In a work of the present nature it will suffice to say that the lesser Malay chevrotain, as this species is frequently called, is chiefly distinguished from the napu by its inferior bodily dimensions, and by the presence of only *three* white strips on the throat and chest. Of these stripes, the central one is situated within an arrow-head-like brown mark, while the other two form a pair on each side of the latter. As in the napu, the distinctness of these markings shows considerable individual variation. The maximum length, from nose to root of tail, attained by this species is 18 inches. The distribution is very similar to that of the napu, but also includes Cochin China and Cambodia.

THE INDIAN WILD BOAR

(Sus cristatus)

NATIVE NAMES.—*Suar*, *Barha*, AND *Bad* OR *Bura Janwar*, HINDUSTANI ; *Dukar*, MAHRATHI, GUZERATI, AND SINDI ; *Hikh*, BALUCHI ; *Guraz* AND *Kuk*, PUNJABI ; *Pandi*, TAMIL AND TELEGU ; *Katu-pani*, TAMIL ; *Paddi* OF THE GONDS ; *Bir Sukri*, HO-KOL ; *Kis* OF THE HILL TRIBES OF RAJMEHAL ; *Handi*, *Mikka*, *Jevadi*, *Kari-jati*, CANARESE ; *Sukaram*, MALABARI ; *Waluru*, CINGALESE ; *Banel*, NEPALESE ; *Ripha* AND *Phak* OF THE BHOTIAS OF DARJILING ; *Sarao* IN THE DAPHLA HILLS ; *Bali* AND *Techim* OF THE MISHMIS ; *Snian* IN THE KHASI HILLS ; *Vak* IN THE GARO HILLS ; *Omar* AND *Hono*, KACHARI ; *Kubak*, *Tharo*, *Kashag*, *Mengi*, AND *Vak* OF THE NAGAS ; *Eyeg*, ABOR ; *Mu*, KHAMTI ; *Ok*, MANIPURI ; *Vu*, KUKI ; *Vhu*, AKA ; *Wa*, SINGPHO ; *Tau-wet*, BURMESE ; *Kalet*, TALAIN ; *Hto* OF THE KARENS ; *Mu* IN THE SHAN STATES ; *Babi-utan*, MALAY

(PLATE VII. FIG. 7)

If the chevrotains afford but little in the way of sport, the deficiency is amply made up by the Indian wild boar, which is one of the gamiest of all four-footed animals, never giving in without a gallant struggle for life, and invariably fighting bravely to the bitter end. If not actually the very first, "pig-sticking" is indeed one of the finest and most exciting of all Indian field-sports, calling into play all the bodily activity and skill of both horse and rider, and also making no inconsiderable demands on the nerve and coolness of the latter. The element of danger is, indeed, by no means lacking in this noble pastime ; and if pig-sticking is to take a secondary place among Indian sports it is only by tiger-shooting that it

can be superseded. Nor are tangible trophies altogether wanting to reward the successful sportsman, for although boars' tusks are not to be compared in size or effect with either horns or antlers, yet, in their way, they are decidedly handsome objects, and are capable of being worked up as accessories of several useful and ornamental articles.

Since every one is familiar with a pig, and a wild boar is nothing more than a pig that has not been shorn of its natural glories by the effects of long-continued domestication, it will be unnecessary to waste the time of the reader by pointing out how the members of the family *Suidæ* differ from the other representatives of the hoofed mammals, or by showing how the typical pigs of Europe and Asia are distinguished from the bush-pigs and wart-hogs of Africa.

Attention may accordingly be concentrated on the Indian wild boar itself. And here it may be mentioned that the characters by which this animal is differentiated from the wild boar of Europe are so trivial, that by the majority of those sportsmen who give any attention at all to the matter it is probable the two animals are regarded as inseparable, and it is only by the naturalist that these distinguishing features are rightly appreciated. Indeed, even among naturalists there has been by no means a general agreement on the subject, the Indian pig having been considered by many as a mere variety of its European cousin. At the present day the general consensus of opinion is, however, in favour of regarding the Indian wild boar (of which, by the way, the proper name is *cristatus*, and not *indicus*) as a species distinct from, although nearly allied to, the European *Sus scrofa*. The near relationship of the two species is shown by the shape of the lower tusks; the transverse section of these forms a triangle, of which the hinder surface is only slightly narrower than the front one, while the outer surface has but half the breadth of the one first named. The importance of this apparently trivial feature is referred to later on.

Adult males of the Indian wild boar not unfrequently stand from

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33 to 36 inches in height at the shoulder, and it is even stated by Mr. Simson that a very old individual killed in Bengal (where very large boars are far from uncommon) fell but little short of 38 inches. In length a full-grown boar will measure about 5 feet from the muzzle to the root of the tail; the length of the latter appendage being from 8 to 11 inches or more. From 200 to 300 pounds, or even considerably more, may be given as the weight attained by the Indian wild boar; and that the European species runs to about the same bulk is attested by a specimen killed in Spain by the Duke of Orleans, the weight of which was 302 pounds. It is comparatively seldom that the lower tusks of the Indian wild boar, when removed from the jaw, measure more than about 9 inches along the outer curve. Six specimens are, however, recorded by Mr. Rowland Ward as measuring between 9 and 10 inches, while he registers one of 10, a second of $10\frac{1}{2}$, and a third of $10\frac{3}{4}$ inches. These dimensions are, however, much exceeded by two tusks (one malformed), the respective lengths of which are given by their owner as $14\frac{3}{4}$ and $14\frac{3}{4}$ inches. A tusk from Java, probably belonging to the Malay race (*Sus cristatus vittatus*) measures $12\frac{3}{16}$ inches; the maximum dimensions recorded for tusks of the European wild boar being $11\frac{1}{4}$ and $11\frac{1}{2}$ inches, these being taken from Caucasian specimens.

Although it is very difficult to make exact comparisons owing to the want of a sufficient number of well-mounted specimens, it seems that the Indian wild boar is a taller and more scantily haired animal than its European relative, but with a more strongly developed crest or mane of elongated black bristles running from the nape of the neck down the back; and it is also stated that the tail, which reaches nearly to the hocks, is more thickly tufted at the tip, but this requires confirmation. It seems, moreover, certain that the Indian species invariably lacks the woolly under-fur commonly found in *Sus scrofa*. An important distinction is to be found in the greater length and complexity of the last lower molar tooth in each

jaw of *S. cristatus*; the length of this tooth generally exceeding the combined length of the two molars immediately in front. The general colour of the coarse and bristly hair of the adult is black, more or less mixed with rusty brown or whitish; the general tint being, however, browner in young, and greyer in aged individuals. It may be added that there is not a distinct whitish streak on the sides of the face, and that there are never warts on any part of the head. As in other wild representatives of the genus *Sus*, the newly-born young are of a light yellowish-brown colour, marked with longitudinal stripes of dark brown. Occasionally, in thick forest and jungle, entire herds of wild pig are met with in which the general colour of the hair is brown, instead of black; but there is no evidence that this difference indicates a distinct local race.

The Indian wild boar (*Sus cristatus typicus*, to give it its full title) is found from the Himalaya (where it ascends to a very considerable elevation) throughout India, Ceylon, and Burma. Whether the wild swine of Baluchistan and Afghanistan belong to this species, or to the European *S. scrofa* (which is probably the form found in Persia) is not yet definitely determined, although Mr. Blanford thinks that such may very probably be the case. The same remark applies to the wild swine of Kashmir. Under these circumstances it has not been considered advisable to introduce the typical *Sus scrofa* as a member of the fauna of the area treated of in the present volume.

Information is likewise required as to the wild pig inhabiting the Malay Peninsula. In Java, and some of the other Malay Islands, the Indian wild boar is, however, represented by a local race (*Sus cristatus vittatus*) distinguished by possessing a white streak on the side of the face. And here it may be well to mention that Java, as well as others of the Malay Islands (notably Borneo), is the home of a very distinct species of the genus, known as the warty pig (*Sus verrucosus*). In addition to the presence of several small warts on the head, from which it derives its

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name, this species is broadly distinguished from the European and Indian wild boars by the form of the transverse section of the lower tusks, in which the outer surface, instead of being narrower, is nearly double the width of the hinder one.

To a considerable extent the Indian wild boar is a nocturnal animal, hiding in thick covert—it may be long grass, cultivated crops of grain or sugar-cane, bushes, or, more rarely, forest—during the greater part of the day, and issuing forth to feed in the early mornings and evenings. The extent to which pigs are nocturnal varies, however, a good deal according to the degree in which they are disturbed by man ; and in certain districts they may be seen feeding till comparatively late in the day. On moonlight nights they remain out for many hours ; and in cultivated districts the damage they do to growing crops by turning up the soil with their snouts, is frequently very extensive. The “sounders,” as the herds in which they associate are commonly termed, are composed exclusively of sows, immature boars, and young ; the old boars spending a morose and solitary existence by themselves. The usual number of individuals in a sounder does not ordinarily exceed about ten or a dozen, although occasionally as many as a score, or even more may be seen in company. The solitary old boars are at all times extremely awkward customers to tackle ; and the natives of certain districts of the Himalaya have a saying that it is as easy to face a tiger as one of these veteran and crusty old swine. Although mainly vegetable-feeders, wild swine by no means restrict themselves to a diet of that description, being, in fact, like their degenerate domesticated relatives, more or less omnivorous. Not only will they make a hearty meal off carrion, but in Assam they are stated to be in the habit of digging up the fish which have taken refuge in the mud of the river-beds during seasons of drought. If they have a partiality for one kind of vegetable food more than another, it is for the roots and tubers of plants growing in moist situations ; and they always prefer marshy situations, such as the banks of

jhils and tanks, to dry ones, wallowing in mud being a favourite pastime among pigs of all descriptions.

Pigs increase with great rapidity, the period of gestation being only about four months, so that there is ample time for the production of a couple of litters a year, the number of young produced at a birth being generally from four to six. In certain districts, at all events, Indian swine are in the habit of forming a rude kind of shelter of grass, in which the sows are reported to place their offspring for security ; while occasionally the old boars resort to the same refuges. The flesh of young porkers is excellent eating, but since cooks in India are for the most part Mohammedans there is great difficulty in getting it dressed for table, and the carcase is usually made over to the *saises*, or grooms, and other low-caste Hindus, by whom the meat is much relished.

At the first burst, a wild boar starts off at a rattling pace, but he is not long-winded, and is sooner or later caught up by the horseman unless the ground is of very bad character indeed, nor are the sows much, if at all, superior in speed and wind to the boars. When brought to bay, the old boars, as already mentioned, fight in the most determined manner, charging at every horse that comes in their way, and inflicting terrible wounds with their formidable lower tusks by a side sweep of the head. And a competent observer has given it as his verdict that there is not a bolder animal in the world than a wild boar. Not that they are specially vicious by nature, for if unmolested, they will generally leave the passer-by alone ; but when once roused, they “mean business.” Even the lordly tiger cannot attack one of them with impunity, there being several instances on record where “stripes” has come off worst in an encounter of this description. But it is not every boar that displays the same amount of boldness and courage, nor indeed of speed ; and it is stated that while the comparatively lightly-built and “leggy” animals characteristic of the Deccan and the Punjab possess the greater capacity for speed, the heavier

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and more massive boars from the swampy districts of Bengal display the best fighting powers.

Wherever the country is suitable for riding, "pig-sticking" is the only legitimate sport connected with *Sus cristatus*. As this sport has been described over and over again with a wealth of detail which would be impossible within the allotted limits of the present volume, the reader may be referred to the numerous works on the subject, among which may be specially mentioned the late Mr. F. B. Simson's *Letters on Sport in Eastern Bengal*, and the well-known volume by the late Mr. J. Moray-Brown.

In the Himalaya and the hills of Ceylon, where riding is impossible, the wild boar is, however, occasionally shot by those who care for such sport, or (in Ceylon) hunted with hounds. Of the latter sport a vivid and interesting account is given by the late Sir Samuel Baker in his characteristic style. When boar-hunting in the hill-forests of Ceylon that sportsman followed the hounds on foot, and tackled the boar at bay with the hunting-knife alone. Comparatively few would, however, care to follow his example in this respect; and the spear is the weapon generally chosen to give the *coup-de-grace* in this exciting and dangerous kind of sport. Sir Samuel expresses great admiration for the general "cuteness" of the Indian wild boar, saying that not only is it a fierce antagonist, but that it is a creature which always knows its own mind and acts up to its own convictions, never hesitating in a course on which it has once determined. If it decides to go forward, nothing will stop it; while, on the other hand, if it determines to break back, not even a serried line of elephants will check its mad rush. Giving a sharp jerk of its mobile snout, first to one side and then to the other, it will dash headlong through the line, leaving its mark even upon the tough hide of the legs of the elephants, should they attempt to bar its progress.

In regard to its powers of scent, the author last named makes the following interesting observations:—"I have frequently seen a pig

making apparently direct for my position, but it meets a small jungle-path upon which some person has been walking. The pig at once halts, smells the ground, and waits, listening attentively and making up its mind. It may be that it determines to go forward ; if so, it starts off at its best pace ; but should it declare for a retreat, it waits, listens for the advance of the line of beaters, and quietly hides in the densest bushes. At last, with shouts sufficient to scare away every animal for miles around, the beaters arrive ; you know the pig is there, but nobody has yet discovered it. Just as the beaters have brought their line in good order to the extreme margin of the jungle, there is a sudden outburst of shouts and yells, a rush in all directions ; screams and halloes ; sticks going upon all sides ; a few short angry grunts, and a rattling of loose stones, explain that the boar has broken back through the line of beaters."

Those of my readers who take an interest in extinct animals may like to learn that in past times Northern India was inhabited by two gigantic species of pig (*Sus giganteus* and *S. titan*), one of which was apparently nearly as large as a good-sized mule, although of course shorter in the legs. These extinct species were allied to the warty pig (*S. verrucosus*), of Java and Borneo, as is shown by the section of their lower tusks.

THE ANDAMANESE PIG

(*Sus cristatus andamanensis*)

According to the observations of Dr. Forsyth Major, the wild pig of the Andamans is only a local race of the Indian wild boar, dwarfed by its insular habitat, and distinguished by the much simpler structure of the last molar tooth in each jaw, and the apparent absence of the crest of long hairs on the back. The height at the shoulder is only about 20 inches ; and the general colour of the hair is black, some of the bristles

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on the back having brownish-grey tips. In each jaw the length of the last molar is less than that of the two teeth immediately in front of it. This pig is restricted to the forests of the Andaman Islands, where its habits are doubtless identical with those of its larger relative of the mainland.

THE MOUPIN PIG

(*Sus cristatus moupinensis*)

The wild pig discovered by the Abbé David in the forests of Moupin, Eastern Tibet, has been separated by Professor A. Milne-Edwards of the Paris Museum as a distinct species, under the name of *Sus moupinensis*. He admits, however, that it has intimate relationships both with the wild swine of Europe and Southern Asia, and since it is almost certain that it is not entitled to rank as a species by itself it is here provisionally regarded as a local race of the Indian species, although it should perhaps be affiliated rather with the European *S. scrofa*. In the present state of our knowledge, it would be useless to recapitulate the characters given by its describer.

THE PIGMY HOG

(*Sus salvanius*)

NATIVE NAME.—*Sano-banel*, NEPALESE

(PLATE VII. FIG 8)

The diminutive size of the wild pig inhabiting the sal-forests of the Terai-land at the foot of the Himalaya in Nepal, Sikhim, and Bhutan, serves at once to distinguish it from all its relatives, although structurally it does not appear to differ essentially from the other members of the

genus *Sus*. The females have only three pairs of teats, instead of the six pairs found in the sows of the Indian pigs, and, in the opinion of some naturalists, this might perhaps be regarded as sufficient to justify the separation of the pigmy species to form a genus by itself. In this case it would have to be known as *Porcula salvania*, a name applied to it by its discoverer Brian Hodgson, on the supposition that it had one pair of molars less in each jaw than ordinary swine.

In size the pigmy hog does not surpass a hare, the height of a full-grown boar not exceeding a foot, and the length from the muzzle to the root of the tail being only about 26 inches. The tail, too, is unusually short, measuring only about an inch and a quarter; and the ears, unlike those of the Indian wild boar, are small and naked. Although there is no distinct crest, the hairs on the hinder part of the neck and the middle of the back are slightly longer than those on other regions of the body. The general colour of the adult is brown or blackish brown, owing to a mixture of brown and black hairs; but the young are marked with longitudinal rufous stripes on a brown ground, with the under-parts white.

Hodgson describes the pigmy hog as living in herds of from five to twenty head among the tall grass-jungle of the Terai; the old boars associating with the other members of the herd. Since, like other wild swine, they only come out into the open at night, they are but rarely seen, and still more rarely shot. Were it not for the difficulty already alluded to in regard to getting pork cooked by Indian servants, it is probable that the flesh of this little species would form a delicate dish. The pigmy hog has been exhibited in the London Zoological Gardens, where it has bred.

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THE LION

(*Felis leo*)

NATIVE NAMES.—*Sher*, *Babar-sher*, AND *Singh*, HINDUSTANI; *Untia-bagh* (camel-coloured tiger), GUZERATI; *Sawach* IN KATHIAWAR; *Shingal*, BENGALI; *Sah* (lion), AND *Sining* (lioness), KASHMIRI; *Rastar*, BRAHUI

(PLATE VIII. FIG. 1)

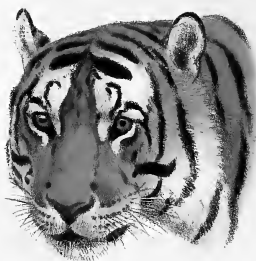
Since the present volume is in no sense a natural history, it will be unnecessary to point out in what respects the Carnivora, of which the lion is the first representative, differ from the Ungulata, to which the whole of the foregoing pages have been devoted. Neither is there any occasion to indicate the distinctive characteristics of the *Felidae*, or cat tribe, of which the lion likewise stands first on the list, since such details are to be found in any work on general natural history. Moreover, the lion itself is such a well-known and familiar animal, that any detailed description of its external features and colour would be not only superfluous, but wearying to the reader.

The tiger being the great Indian cat *par excellence*, while the lion occupies an analogous position in the fauna of Africa, people are very apt to forget that the latter has equal claims to be regarded as an Asiatic animal, and that although now verging on extinction in India itself, it is still comparatively abundant in parts of Persia and Mesopotamia, as it probably once was in India, where, however, its range seems always to have been restricted to the central and north-western districts of the mainland.

That it was once a familiar animal in India is proved by the frequency with which its name has been adopted by distinguished native families, as



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PLATE VIII

- | | |
|---------------------|----------------------|
| 1. Indian Lion. | 7. Fishing-Cat. |
| 2. Bengal Tiger. | 8. Leopard-Cat. |
| 3. Indian Leopard. | 9. Jungle-Cat. |
| 4. Persian Leopard. | 10. Caracal. |
| 5. Snow-Leopard. | 11. Tibetan Lynx. |
| 6. Clouded Leopard. | 12. Hunting-Leopard. |

exemplified by the occurrence of such names as Ranjit Singh, and Ranbir Singh among the Sikh chieftains of the Punjab, and that of Sher Ali among the Mohammedan rulers of Afghanistan.

As regards the last-named country and the neighbouring state of Baluchistan, lions are indeed now quite unknown in both, neither is the writer acquainted with any historical evidence of their former existence in these states, although it is more than probable that this area was once included within the range of the species. If, however, the animal ever extended northwards of India at all, it is most likely that, within historic times at any rate, Afghanistan formed its limits in that direction. Had it ever existed in Central Africa it would probably have survived long enough to be remembered at least by tradition.

The last great stronghold of the lion in India is the peninsula of Kathiawar, forming part of the district of Guzerat, and bounded on the south by the Gulf of Cambay and to the north by the Gulf of Kutch ; but they also lingered, at least to a very recent date, in Kutch, to the north of the last-mentioned gulf. A few years ago natives were also stated to bring in from time to time reports of the occurrence of an occasional lion in Central India ; and a few may still linger in the wilder districts of Rajputana, more especially to the south of Jodhpur, in Oodeypur, and around Mount Abu, where they were once common. In Kathiawar the favourite haunt of lions is the district known as the Gir. Among specimens obtained in Kathiawar of recent years, Mr. Rowland Ward records one killed by Lord Harris, and a second by Lieut.-Col. Fenton ; while his list also includes one shot years ago in Central India by Captain Smee. Going back to earlier years, a writer in the *Oriental Sporting Magazine* for 1876 gives an account of a hunt in which four males were seen, one of these being bagged and a second wounded. In 1873 a lion is reported to have been killed near Goona, in which neighbourhood, as well as near Gwalior and Kota, and likewise in the districts between Saugor

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and Jhansi, these animals were still by no means very uncommon about thirty years ago. In 1866 two of the engineers engaged in the construction of the railway between Allahabad and Jabalpur shot a lion close to the line; and about thirty years before that date lions were comparatively common in the Ahmedabad district, while in the first and second decades of the century they were to be met with in Sind and as far to the east as Palamou and Rewa.

In reply to enquiries by the present writer, the following letter was communicated to *The Asian* newspaper of June 19, 1900:—

“The Gir Forest of Junagarh, which is believed to be the last remaining abode of Indian lions, now consists of about 600 square miles of rugged and undulating country with a few conspicuous hills, some torrent beds, and a not very thick jungle of dwarf teak, with plenty of korinda and other thorn-bushes and occasional clumps of fine trees.

“In the limits of Mendarda and the Gackwar’s districts in Kathiawar, which border on the Gir, there are occasionally a stray lion or two, but their habitat is the Junagarh Gir, as may be judged by the fact that when the Gackwar wishes to shoot a lion he generally asks the Junagarh Durbar to let him shoot in their limits.

“In 1893, when the Durbar became alarmed at the extinction of lions, a rough census was taken, and the number remaining was estimated at twenty-six, which subsequent estimate raised to thirty-one. Since 1893 the number shot is known to be six, including those for which the Durbar gave sanction; and the skins of two others were found in the jungle. During these past seven years four cubs have been captured, and the number of lions in captivity in the gardens of H.H. the Nawab of Junagarh is now seventeen as against thirty not many years back. Of cubs born in captivity it has been found that no less than ten out of twelve died.

“There are now estimated to be only twenty lions remaining in the

Gir, of which eight are cubs. The extinction of this noble game would seem, therefore, to be only a question of time, and as the Gir is more and more opened up by roads, the rate of extinction will perhaps increase."

The lion shot by Lord Harris is described as having a fine mane ; so that, to say nothing of others, this specimen alone is sufficient to disprove the story long current among naturalists as to the maneless character of the "Lion of Guzerat." The idea that all Indian lions were devoid of a mane arose from the description of an immature specimen. But if the absence of a mane is not a distinctive feature of the Indian lion, it is possible that a claim to racial distinction may be drawn from the colour of the mane, unless indeed too few specimens are now in existence to render the point certain. Although he has not personally seen the skin of a maned Indian lion, the present writer has never heard of the occurrence of a black-maned specimen from that country. In the *Badminton Library* Lieut.-Col. Heber Percy goes indeed so far as to make a definite statement that black-maned lions are absolutely unknown in India.

In Africa, as is well known, no racial distinction can be drawn between black-maned and tawny-maned lions, since both types may occur in one and the same litter. But, so far as the writer is aware, there is no district in Africa where all the lions are tawny-maned ; and in any case, it is absolutely certain that black-maned lions are of common occurrence in Somaliland and other parts of North-Eastern Africa, where these animals tend to run small. Consequently if it could be absolutely proved that all Indian lions were tawny-maned, there would be *prima facie* evidence of their right to be regarded as the representatives of a distinct local race. In the future some light may be thrown on the question by an examination of the characters of the Persian lion, which will very probably be found indistinguishable from the Indian. If Persian lions be all tawny-maned, the question may be regarded as settled. The name *Felis leo guzeratensis*

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will be the proper distinctive title of the Indian lion, in the event of its claim to recognition as a distinct race being substantiated by future investigation.

And here it may be mentioned as a matter for extreme regret that, in addition to the lack of skins, the British Museum has, we believe, no example of the skull of the Indian lion. But even if it possessed one or two specimens, these would be of little or no real use, as a large series would be essential in order that an exact comparison should be made with skulls of African lions. Were such a comparison possible, distinctive cranial characters might be recognised in the Indian lion sufficient to separate it as a more or less well-marked local race from all the African representatives of the species.

So far as the material at hand admits of forming an opinion, it would seem that the Indian lion was a comparatively small animal, much inferior in point of size to the lion of many parts of Africa, and more nearly equal to the generally small Somali race. On the other hand, it must be remembered that where an animal is on the verge of extermination, its few surviving members are scarcely likely to attain the maximum dimensions of their race. Consequently the Indian lion may once have been a larger animal than it has shown itself in modern times; although the analogy of the lions of Persia and Somaliland is against this hypothesis.

A lion killed years ago by Captain Smee, measured 8 feet 9½ inches in length before skinning; one mentioned in the *Delhi Gazette* as having been shot in Central India, was only 8 feet 7 inches; while the specimen mentioned above as described in the *Oriental Sporting Magazine* for July 1876, reached 9 feet 3 inches. The specimen shot by Lord Harris was, according to Mr. Rowland Ward, still larger, its length being 9 feet 7 inches; but the one killed by Colonel Fenton was somewhat smaller, its total length being 9 feet 5 inches. As lions of considerably over 10 feet in length have been obtained, even in Somaliland, it will be obvious that none of the above-mentioned specimens can be regarded as really large

animals. The length of the skull of Lord Harris's specimen is only $13\frac{1}{4}$ inches, whereas a Somali lion-skull of 15 inches is on record, and a South-East African example reaching $16\frac{1}{2}$ inches is known.

Many years ago a pair of Asiatic lions were exhibited in the Surrey Zoological Gardens. They were brought home from Basra, at the head of the Persian Gulf, in H.M.S. *Boyne*, by the Captain of which vessel they were presented to George IV., and on arrival were deposited in the Royal Menagerie at Exeter Change. They were described as of relatively small size, with the hair of a very pale fawn colour.

The lion being essentially an inhabitant of more or less open dry and sandy districts, a large portion of India, such as the Assam Valley, the sub-Himalayan Terai, the sal-forests of the Narbada, the swamps of Lower Bengal, and the greater part of Madras, would be totally unsuited to its habits; and its limited geographical distribution in the country is thus easily accounted for. The same cause explains its absence from the countries to the eastward of the Bay of Bengal. When less uncommon than it now is, the Indian lion was said to avoid, as a general rule, heavy forest, preferring sandy hills covered with thin scrub and grass, among which it might be stalked on foot without that excessive danger attached to tiger-shooting under similar conditions. According to native reports, lions in India were always in the habit of selecting one particular bush or tree for their mid-day place of repose, so that when one was known to be in the neighbourhood, its discovery when wanted was an easy matter. This may have helped considerably to the vast diminution in its numbers which has taken place during the century.

To assume that the Asiatic lion was always restricted to scrub-covered sandy dunes, would, however, be a mistake, for we are informed by the late Sir O. B. St. John that in the valleys of the Tigris and Euphrates these animals often resort to reedy swamps for covert; and that in the neighbourhood of Shiraz they enter both reed-brakes and oak-forest for the

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purpose of preying upon the droves of swine which find shelter and food in such localities.

With regard to the general habits of the lion in India practically nothing of any interest to the naturalist has been recorded. Probably, however, in this respect there is but little difference between the Asiatic and the African animal, and since the habits of the latter have been described so frequently, and with such wealth of detail, the subject may be regarded as practically exhausted, and calls for no further reference on the present occasion.

It is probably superfluous to mention that the male lion is the only member of the family *Felidae* adorned with the flowing mane on the head and fore-quarters which adds so much to the grandeur of its appearance ; the tuft of the tip of the tail being likewise a distinctive peculiarity. It is likewise the only species that is polygamous. The lioness is, in general form, much more like a tiger, to which animal the present species is indeed very closely related. From the occurrence of faint spots in the cubs, it is, however, evident that the ancestor of the lion was a spotted instead of a striped animal. An important difference in regard to the relations of the bones of the face likewise distinguishes the two species. On carefully examining the skull of a lion the nasal bones, which form the roof of the chamber of the nose, will be found to terminate superiorly on the forehead on the same horizontal line as do the upper extremities of the maxillæ, or upper jaw-bones. In the tiger's skull, on the other hand, the nasals reach considerably higher up on the forehead than do the maxillæ.

But this is by no means the only difference. Compared with that of a tiger the great upper carnassial or flesh-tooth of the lion has the tubercle near the front extremity of the inner side very markedly smaller. And in this respect the lion approaches nearer to the great extinct sabre-toothed tigers than does its striped relative.

THE BENGAL TIGER

(Felis tigris)

NATIVE NAMES.—*Bagh* (tiger), *Baghm* (tigress) AND *Sher* (tiger), *Sherm* (tigress), HINDUSTANI ; *Nahar*, OR *Sela-vagh*, HINDI OF CENTRAL INDIA ; *Babr*, PERSIAN ; *Mazar*, BALUCHI ; *Shink*, SINDI ; *Padar-suh*, KASHMIRI ; *Patayat-bagh* AND *Wahag*, MAHRATHI ; *Go-vagh*, BENGALI ; *Tut*, AND *Sad* OF THE HILL-TRIBES OF RAJMEHAL ; *Garumkula* OF THE KOLS ; *Lakhra* OF THE URAONS ; *Krodi* OF THE GONDS ; *Kula* OF THE SONTHALS AND KORKUS ; *Puli*, TAMIL, TELEGU, MALABARI, AND GONDI ; *Puli-redda-puli* AND *Peram-pilli*, TAMIL ; *Pedda-puli*, TELEGU ; *Perain-puli* AND *Kudua*, MALABARI ; *Kuli*, CANARESE ; *Nari* OF THE KURGS ; *Pirri* AND *Bursh* OF THE TODAS OF THE NILGIRIS ; *Tag*, TIBETAN ; *Tukt*, OR *Tuk*, OF THE BHOTIAS OF DARJILING ; *Sathong* OF THE LEPCHAS ; *Kch-va*, OF THE LIMBUS (another East Himalayan tribe) ; *Schi* OF THE AKAS ; *Matsa* OF THE GARO HILL TRIBES ; *Kla* OF THE KHASI HILL TRIBES ; *Sa*, *Ragdi*, *Tekhu*, AND *Khudi*, OF THE NAGAS ; *Humpi* OF THE KUKIS OF THE MISHMI HILLS ; *Sumyo* IN ABOR ; *Su* IN THE KHAMPTI DISTRICT ; *Sirong*, SINGPHO ; *Kei*, MANIPURI ; *Misi*, KACHARI ; *Kya*, BURMESE ; *Kla*, TALAIN ; *Khi*, *Botha-o*, AND *Tupuli*, OF THE KARENS ; *Htso* OF THE SHANS ; *Rimau*, *Arimau*, OR *Harimau*, MALAY

(PLATE VIII. FIG. 2)

As the wolf looms large in the nursery-stories and fairy tales of Europe, so the name of the tiger is writ large in the folk-lore of the natives of India and the Malay countries. Among the Malays there is a deeply ingrained belief that those versed in occult arts are capable of transforming

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themselves at will into tigers, as there is in the existence of "ghost-tigers" (*rimau kramat*), which latter are invulnerable and always to be recognised by having one foot smaller than the other. But perhaps the most curious of all these legends is one relating to the origin of the tiger's stripes. A boy, so runs the legend, of an incorrigibly bad disposition, was once soundly thrashed by his schoolmaster, with the result that he was transformed into a tiger, who to this day carries on his hide the mark of the stripes with which he was beaten.

Now it is these same stripes which form the most characteristic external feature of the tiger; no other member of the feline tribe being so conspicuously marked in this manner, although a sombre-hued approximation to this type of coloration is presented by the wild cat of Europe and the domesticated "tabby." It has been a prevalent idea among naturalists, till quite recently, that the stripes of the tiger were developed in order to harmonise with the vertical streaks of light and shade to be seen in an Indian grass-jungle, and since the Indian tiger is, as a rule, a more heavily striped animal than its relative of Central Asia and Siberia, this may be true to a certain limited degree. But it must be remembered that the Siberian tiger, which is similarly, although less heavily marked, inhabits a totally different kind of country, and since the tiger appears to be a comparatively recent immigrant into the peninsula of India, it is evident that we must have an explanation of its type of coloration which will apply equally to all phases of its existence; if there be any preferential claim for one part of its habitat rather than another, this preference being due to Central Asia.

From what sportsmen and travellers have told us as to the almost invisibility of zebras when standing in the open, even at a comparatively short distance, the real truth would appear to be that the coloration of the tiger is for the purpose of rendering it as inconspicuous as possible when wandering in the gloaming in search of prey. As remarked by a writer in the

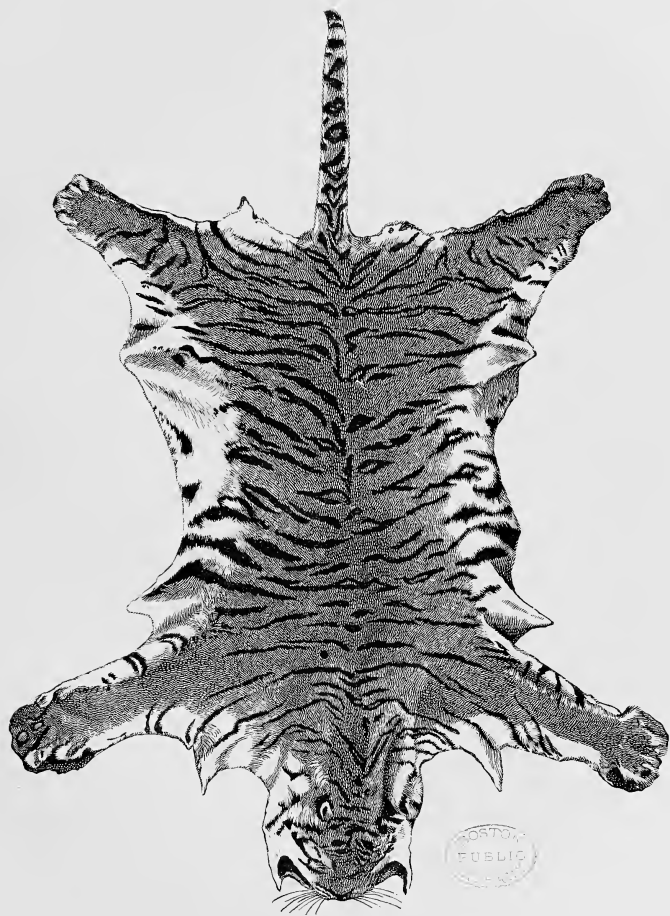


FIG. 53.—Indian Tiger Skin.

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Coruhill Magazine, a tiger shooting out suddenly from the dark jungle on to some unexpecting bullock appears to the spectator more like a puff of grey smoke than anything else in nature, so harmoniously do its colours fade into a grey when seen by the faint light of early dawn or late evening. A much less noisy, but apparently a stronger and more active animal than the lion, the great striped cat of Asia is also a somewhat more variable species, at least three local races being recognisable. Firstly, there is the typical Indian, or Bengal tiger (*F. tigris typica*), with which alone we are concerned on the present occasion. It is a large, long-limbed, long-bodied, lithe, and lanky animal, in which, with the exception of the short ruff on the throat, the fur is uniformly short and somewhat stiff throughout, with the black stripes (frequently double) generally numerous, and the colour of the fur a rich orange or rufous fawn. In the Caspian provinces of Persia and the Caucasus the tigers, on the other hand, run smaller and are more roughly haired. As it is uncertain whether this small Persian race (*F. tigris virgata*) enters the western confines of the area treated of in the present volume, it has not been allotted a separate heading. Lastly, there is the Manchurian tiger (*F. tigris longipilis*) characterised by its large size, heavy build, short and thick limbs, and the great length and thickness of the fur, which is finer, less highly coloured, and generally much more sparsely striped than in the Indian race. The head and muzzle of the Manchurian tiger is likewise very different-looking to that of its Indian cousin. And here it may be remarked that in a species with a wide geographical range, when there are two or more local races whose respective habitats differ considerably in respect to climate, it is an invariable rule that the race inhabiting the colder climate is more heavily built than the one from a hotter region. Although specimens have been exhibited by Mr. Karl Hagenbeck, of Hamburg, the Manchurian tiger has never hitherto been brought alive to England. In spite of its many points of difference from the Bengal tiger, it is quite certain that it is nothing more than a local race of the same species.

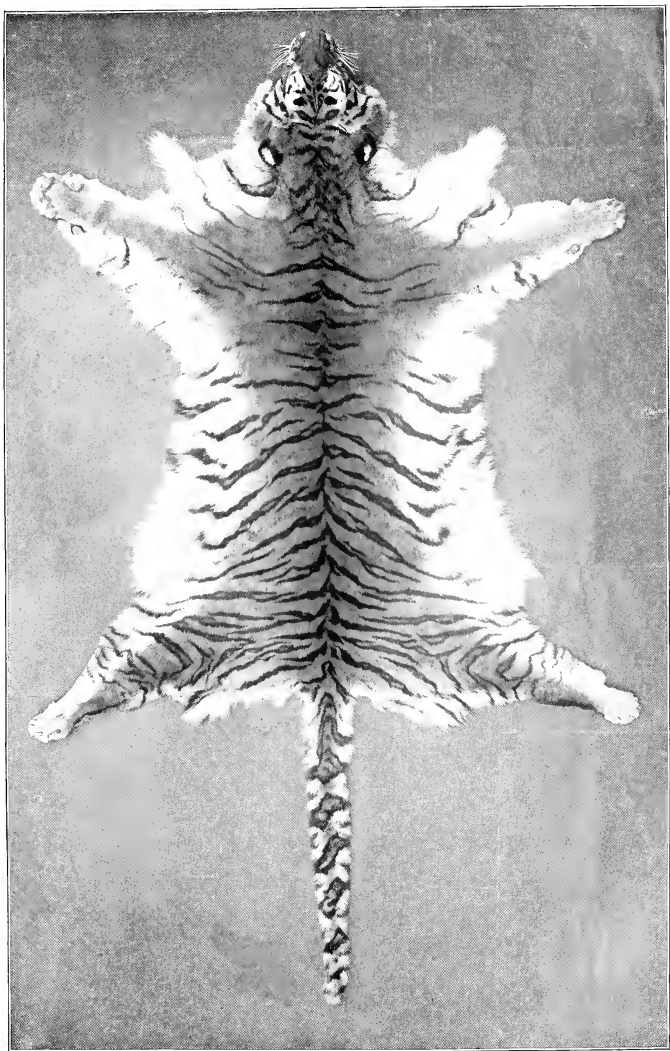


FIG. 54.—Manchurian Tiger Skin.

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Inclusive of the three local races, the geographical range of the tiger extends from the Caucasus through Northern Persia, India, Assam, Burma, and the Malay Peninsula to the Malay Islands, China, Manchuria, and Amurland. The most remarkable fact connected with this large distributional area is the total absence of the animal from Ceylon. And since there is geological evidence to prove that the latter island was connected at no very remote epoch with the mainland of the peninsula, we have strong presumptive evidence that the tiger is a comparatively recent immigrant from the north or east into India itself. Another inference is that the Palk Strait, separating Cape Comorin from Ceylon, is beyond the ordinary swimming powers of the tiger, great as these undoubtedly are. In India tigers are found from Cape Comorin to the Himalaya, ascending in the latter range to an elevation of about 7000 feet above sea-level. It may be added that these animals are unknown in Afghanistan and Baluchistan.

As mentioned incidentally above, there is a considerable degree of variation in the richness of the ground-colour of the fur of Indian tigers, and occasionally specimens are met with in which the whole colour is creamy buff, with the stripes only showing somewhat darker in certain lights. Unfortunately, in most instances at any rate, there is no information as to whether these white tigers were true albinos.

A white tiger was exhibited alive at Exeter Change about 1820, while a second was killed at Poona about 1892. In March 1899 a white tiger was shot in Upper Assam and the skin sent to Calcutta, where yet another specimen was received about the same time. In regard to the former specimen, now the property of Mr. W. J. Consadine, Major H. G. C. Swayne, by whom it was seen, wrote to the publisher as follows :—
“The colour of the skin is like that of a polar bear, with the faintest lines to indicate stripes. The ground-colour is bright creamy white, exactly like a polar bear ; the darker lines, representing stripes, are about the dull white of a rather dirty white cat which has been out all night on

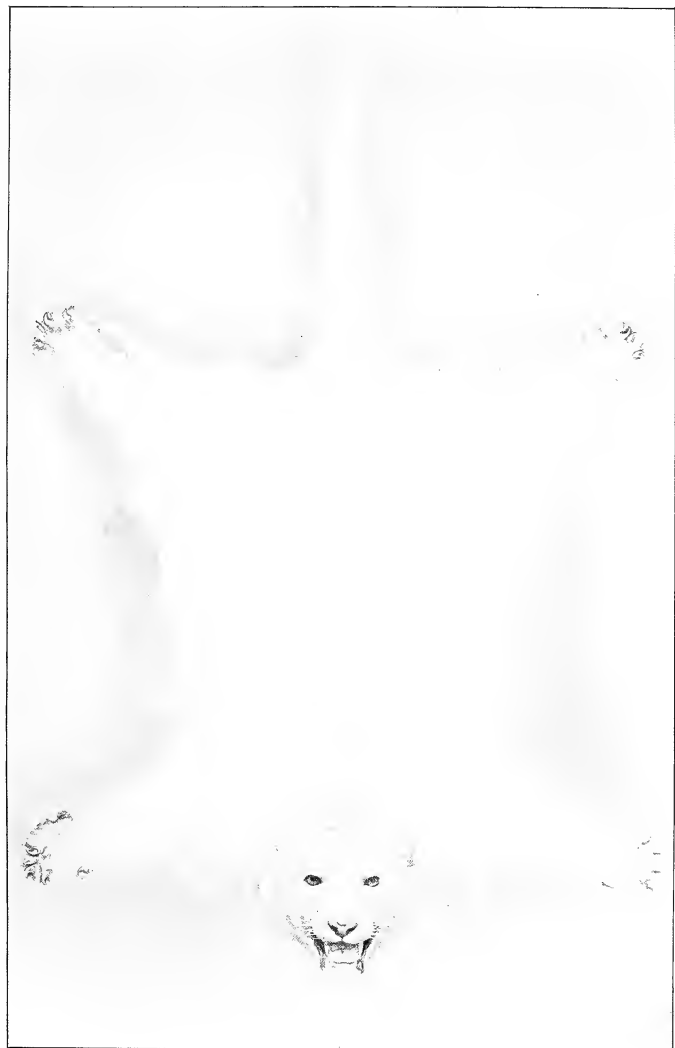


FIG. 55.—White Tiger Skin.

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the roof." The present writer subsequently saw this interesting specimen, as well as another belonging to the Maharaja of Kuch Behar.

Many years ago a perfectly black tiger was found lying dead near Chittagong.

A subject which has been fertile in more or less unprofitable discussion is the maximum length attained by the Indian tiger. In this case, as in the instances of the height of elephants and the length of whales, there is no doubt that in the old days—whether from careless measurements or otherwise, we need not pause to inquire—grossly exaggerated ideas were prevalent. But when close criticism was brought to bear on the question there seems equally little doubt that, as in the other cases instanced, scepticism was pushed too far, and the maximum dimensions underrated. Unfortunately, the measurement of length is not always taken in the same manner, it being sometimes the interval between the muzzle and the tip of the tail in a straight line, and in other cases the length of the same interval following the curves of the head and body. The latter method, commonly known as "sportsman's measurement," is the one usually adopted, and was doubtless used in all the under-mentioned instances. Measured in this fashion, full-grown tigers commonly range between 9 and 10 feet, and tigresses between 8 and 9 feet. But larger animals undoubtedly occur at times. The two largest recorded by Mr. Rowland Ward respectively measure 10 feet 7 inches and 10 feet 6 inches. These, however, if we are to give credit to sportsmen whose testimony should be above suspicion, by no means approach the maximum.

In *The Asian* newspaper for February 1896 the late Mr. Moray Brown published the following list of unusually large tigers, omitting mention of all those which fell short of 11 feet:—"Firstly, we find the late Sir J. F. Yule stating that he has 'killed tigers of 11 feet odd inches twice or thrice.' Colonel George Boileau 'killed a tiger

at Muteareah in Oudh that was well over 12 feet before the skin was removed, adding that it was of quite an exceptional size, and in his experience of seventeen years' constant hunting he had never seen its equal.' The Hon. J. R. Drummond, sometime Commissioner of Rohilkund, says 'he never saw a 12-foot tiger, though he shot one of 11 feet 9 inches, measured *as he lay on the ground before being padded.*' Colonel D. G. Stewart says the largest tiger he ever saw measured 11 feet $\frac{1}{4}$ inch. 'He had personally measured eighty tigers.' General Sir H. Green says 'the biggest tiger he ever assisted in killing was one shot near Surat, which was 11 feet 11 inches, measured as it lay, and whose skin when pegged out was 12 feet 4 inches.' Sir H. Green shot one himself which measured 10 feet 11 inches. He adds: 'I heard by last mail from Claude Clerk at Hyderabad, who said he had just killed to his own gun the biggest tiger he had ever seen, as it measured 11 feet 6 inches before skinning.' Sir H. Green concludes by expressing his belief that, 'though they must be very rare, tigers of 12 feet and over do exist.' Mr. C. Shillingford, . . . whose experience extended over thirty-five years, during which period he shot more than two hundred tigers, says that in 1849 he shot the largest tiger he had ever seen, which measured, as he fell, 12 feet 4 inches. This tiger was very old, with short hair and light in colour. Mr. Shillingford shot another of 11 feet 10 inches, and in 1855 one of 11 feet 4 inches. . . . Mr. Cumming shot 'a few over 11 feet; one at Rohinipore of 11 feet 4 inches, one at Kaladearah in 1865 of 11 feet 2 inches, and one at Gour in 1871 of 11 feet 2 inches.' Finally, Sir Charles Reid informed Sir Joseph Fayrer 'that he had shot in the Dun a tiger which measured 12 feet 3 inches *before the skin was removed.*'"

To the above may be added a supplemental list furnished by Mr. F. A. Shillingford (nephew of the above-mentioned gentleman of the same name) to the same journal for August 1896. It is there written:—

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"On 20th March 1866 my neighbour, the late Mr. Henry Cave of Gondwarah, Purneah, shot a tiger 11 feet, measured on the ground *where he fell*, and the hunt is described in the *Oriental Sporting Magazine* for July 1868. On 13th December 1867, at Bankacot, about four miles from this factory (Kolassy, Purneah), I accounted for a tiger 11 feet, *measured about three hours after death*. On 18th October 1868 my brother, the late Mr. J. Shillingford, shot a tiger 11 feet. On 3rd November 1868, Mr. J. Shillingford shot the largest of his many large tigers at Baralia Thappa Tappra, in the Kosi Duars, measuring 11 feet 5 inches. On 18th April 1870 the late Mr. W. DeCourcy shot a tiger 11 feet 1 inch. On 19th April 1871 Mr. J. Shillingford shot a tiger 11 feet."

It may also be mentioned that a few years ago a lady (Mrs. Lawrie-Johnstone) shot in the Duars a tiger of which the skin when removed measured 12 feet 5 inches in length. At the time of its death this animal could scarcely have measured less than 11 feet 1 inch.

The following dimensions and weight of tigers have been kindly furnished to the author by the Maharaja of Kuch Behar.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.
	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.
Total length . . .	10 1 $\frac{1}{2}$	10 0	9 10 $\frac{1}{2}$	10 3	10 0 $\frac{1}{2}$	10 1	10 2 $\frac{1}{2}$
Do. of body .	7 1 $\frac{1}{2}$	6 11	6 11 $\frac{1}{2}$	7 1 $\frac{1}{2}$	6 11	6 11	7 0
Girth behind shoulders	54	52	54	52	54 $\frac{1}{2}$	51 $\frac{1}{2}$	48 $\frac{1}{2}$
Upper arm . . .	29	26	29	29	27 $\frac{1}{2}$	26 $\frac{1}{2}$	26 $\frac{1}{2}$
Forearm	21	21	19	19 $\frac{1}{2}$	20	20	20
Head	40 $\frac{1}{2}$	36	39 $\frac{1}{2}$	36 $\frac{1}{2}$	38	37	38 $\frac{1}{2}$
Height at shoulder .	44 $\frac{3}{4}$	40	40	40 $\frac{1}{2}$	38	36 $\frac{1}{4}$	38 $\frac{1}{2}$
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Weight	?	520	508	487	493	496	500

Of Number 1 the Maharaja writes that "this is undoubtedly the biggest and heaviest tiger I have shot or seen shot. Unfortunately

I was unable to weigh him, as we had no scales out with us, but he must have weighed close on 500 pounds."

So much literature has been devoted to the habits of tigers and tiger-shooting, that it would be little more than waste of space to recapitulate all the leading points in connection with the former subject, while the latter will be left entirely alone, as it is one of which the writer has no personal experience.

Speaking generally, it may be said that, apart from certain minor differences according as to whether individual animals come under the designation of game-killers, cattle-lifters, or man-eaters, tigers are, as a rule, solitary and unsociable animals, although the male and female associate more closely during the pairing-season. Whether the union be permanent or temporary, it is certain that tigers are monogamous animals. When more than two tigers are seen in company, the party is usually, if not invariably, a family one. It has already been stated that tigers are far less noisy animals than lions; but it has to be added that they are as fully nocturnal in their habits as the latter, and perhaps even more so. Impatience of the direct rays of the summer sun is indeed one of the most marked traits of the Indian tiger, and one, indeed, which strongly supports the view of its being a comparatively recent inhabitant of the more torrid portions of its present habitat. In this connection the writer may refer to another point (brought to his notice by a friend) which appears to afford further confirmation of the same view. This is the extraordinary length and thickness of the fur of Indian tiger cubs—a provision against cold totally unnecessary in their present environment, which may well have been inherited from an ancestor whose home was in the bleak north.

Water is essential to the well-being of these cats, and the necessity for frequent access to this element curtails their wanderings in the hot season, when pools are few and far between. But at other seasons

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tigers are great wanderers; and it is a notable fact that when one tiger occupying a definite "beat" is killed, its place is almost immediately filled by a successor from the neighbourhood. Grass jungles, swamps, and forests are alike the resort of tigers; but, failing these, clefts or caves in rocks, ruined buildings, or dry nalas afford amply sufficient shelter to the striped robber. Like the lion, the tiger is unable to climb trees; but the presence of the latter animals in a district is always made evident by the marks of their claws on the tree-stems, which extend as high as they can reach when standing on their hind-legs.

It might have been thought that, with all that has been written in regard to the habits of tigers, there were few points remaining in dispute. But there is still some degree of difference of opinion with respect to the manner in which they seize their prey. The popular idea that tigers spring upon their victims from a distance, and after killing them by a blow from one of the fore-paws, or by tearing at the throat with the cruel claws, suck their blood, was demonstrated by Mr. G. P. Sanderson, in *Thirteen Years among the Wild Beasts of India*, to be altogether incorrect. From the accounts of natives (and how difficult it is to make accurate observations during the few seconds occupied by a tiger's rush must be self-apparent) that intrepid sportsman came to the conclusion that the tiger clutches the fore-quarters of his victim with his paws, one of which is generally thrown over the shoulder, while with his jaws he seizes the throat from below, and turns it upwards and over, so as to dislocate the vertebræ of the neck: sometimes giving additional weight to the wrench by jumping to the opposite side of the stricken animal.

This explanation was for some time very generally accepted by naturalists; but in a communication to *The Asian* newspaper of 12th July 1895, Mr. F. A. Shillingford raised objections to certain details of the attack as described by Mr. Sanderson. The observations of Mr. Shillingford are as follows:—"Tigers, as a rule, always roar when

charging or fighting in self-defence, but there are exceptions to the rule. In the latter case it would appear that a very savage tiger, in order to wreak his vengeance without fail on the intruders, lies low and attacks without warning. The well-known feint of an attack, termed by the natives *bhagocha*, made by tigers to demoralise a line of beaters, and thus effect an unchallenged retreat, is always accompanied by the loudest roar the tiger can call forth. It seems almost impossible to picture a tiger seizing by the neck *from below* without first closing with his victim. He must turn his neck round until his open jaws face upwards, in order to grip from below, and this can hardly be accomplished without the purchase of his paws on the shoulders, and this, in my opinion, is what occurs in the generality of cases. There are instances in which you see fang-marks, both at the back and in front of the neck, but the former, I take it, is a mere preliminary grip of an obstreperous victim, quickly followed by the fatal clutch below. That the tiger always breaks the neck I do not believe. . . . Let any one open the jaws of the skull of a tiger and then look at the neck of a full-fed buffalo, and he will see this. The expanse of the open jaws would only cover a bunch of the muscles of the neck, and with this grip it seems absurd that the animal could give the fatal wrench that dislocates the neck. In the case of a good bull-buffalo, such as are sometimes killed, it seems doubtful whether the neck of the aggressor, or the victim, is the tougher. That the necks of animals, especially cows, are often broken, may be due to the fall in the struggle, but the idea that tigers systematically set to wrenching their necks, appears to me untenable. That tigers approach their victims stealthily and without noise appears natural, but in the moment of victory, they may roar occasionally to terrify their prey into succumbing sooner. This was exemplified in the case of a planter, seated on an easy chair outside his bungalow, being startled in his reverie by a loud roar to his left, and on looking round he saw some 500 yards off a tiger

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struggling with one of his bullocks in an open field. The tiger killed the bullock, and retreated into the jungle before guns could be got ready."

A very remarkable, and apparently inexplicable difference between tigers and leopards is exhibited by the manner in which they break up their prey. A tiger invariably commences to devour his slain victim at the hind-quarters, whereas a leopard as unfailingly turns his attention at the commencement of his meal to the chest and fore-quarters. This fact is as well known to native shikaris as to European sportsmen. But credence is by no means to be given to all native ideas as to the habits of tigers. It is, for instance, a common idea among them that when a tiger is stalking a herd of sambar or other deer, it will from time to time utter a cry like the call of deer, to which the intended victims will reply. Writing in the *Zoologist* for 1898, Colonel F. T. Pollok seems, indeed, inclined to give credence to this story, although it appears to bear the stamp of pure imagination.

In the condition of their food tigers are by no means particular, and they have on several occasions been observed gorging themselves on putrid carcases, from which the vultures have been driven away by their appearance on the scene. In many cases, at least, they will also consume almost the whole of the animal which affords the meal, rejecting neither skin nor bones, except such of the latter as are too large or too solid to be devoured. Neither do they limit themselves to any particular kinds of animal as food, for tigers have been known to kill and eat bears, leopards, and even individuals of their own species. Colonel Pollok states, for instance, that he has known of several cases in Assam where, after a contest between two of these animals, the victor has made a meal off the body of the vanquished. An instance is also known of a tiger having killed a young individual of its own species over a dead bullock, and eaten the former in preference to the latter. One reason for regarding the tiger as a more active and powerful animal than the lion is that on

every occasion when a contest has taken place in a menagerie between two of these creatures, it is always the tiger that has come off victorious.

Man-eating tigers, which are generally females, are perhaps the most wary of all the members of the species. Although it is probable that some man-eaters have taken to their particular line from being disabled by old age from pursuing more active prey, it is quite certain that this is not the case with the majority, which are often in the pink of health and condition. Rather is the acquisition of the habit to be attributed to the boldness acquired by cattle-lifting tigers, who on some particular occasion summon up courage to attack the herdsman. Having once discovered how much easier it is to kill a man than a cow, such tigers ever afterwards practise man-eating to a certain extent, although only a limited number confine themselves exclusively to a diet of human flesh.

Instances are on record where young elephants have been killed by tigers, but till recently it has not been thought possible that full-grown elephants could be destroyed by these marauders. In *The Asian* newspaper of 15th May 1900, a writer instances a case where, although the evidence is purely circumstantial, such a tragedy appears to have taken place.

After first mentioning that he was disinclined to attach credit to the statements of the natives as to the manner in which the elephant in question came by its death, the writer says that, accompanied by some friends, he visited the spot where the encounter had taken place. His description of the scene that met his eyes is as follows :—

“The place where the remains of the poor elephant lay showed plainly that a hard struggle had gone on there between the elephant and a tiger, or a couple of tigers for aught we knew. The high grass-jungle where the elephant was hobbled and let loose at night for grazing was trodden and trampled down to an extent of about 40 square yards. The elephant was hobbled, and therefore could not run away from its assailants, and its cries of distress and shrill trumpeting were heard by the villagers a couple

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of miles off. The rope hobbles were still on its legs, and the half-severed ear and the holes on the skin of its neck plainly indicated the attacks of a tiger, and left no doubt in my mind that the poor beast was cruelly done to death by a pair of tigers, which must have tackled her from both sides at the same time, and buried deep their fangs in her jugular veins and finished her off quickly. The skin did not seem to have been injured much, and it laid like a pall or rather a tarpaulin, covering up the whole skeleton decently."

The ordinary cry of the tiger is stated to be very similar to the lion's roar, but is much less frequently uttered than the latter, the former animal never standing and emitting roar after roar for an hour together after the fashion which has so often been described in the case of the lion in Africa. When suddenly surprised a tiger springs up with a loud "woof," while, when angered, it gives vent to a growl. Different from all of these is the hoarse guttural sound of a charging tiger, which is repeated two or three times during the short and furious rush. Although occasionally reaching as many as six, the number of tiger cubs in a litter usually varies between two and five, but two is the most common number, and three the next. In all cases of twins, the cubs are respectively male and female. Now it is a well-known fact that tigresses are numerically much more numerous than tigers, and it would be an interesting matter to ascertain whether, in the case of triplets, two of the cubs belong to the female sex. Even, however, if this should prove to be the case, it would seem doubtful if the occurrence of triplets is sufficiently common to account for the disparity in the numbers of the two sexes. The cubs require about three years to attain their full growth, the greater portion of this time being spent with the female parent, who does not appear to breed more frequently than every second, or possibly every third, year.

It has been already mentioned that the reference to tiger-shooting in

this place will be of the briefest. This sport may be divided into four main classes, namely, shooting from elephants, driving with beaters to sportsmen posted in trees, sitting up over the "kill" to await the return of the murderer, and walking up on foot. The last description is certainly the most dangerous, and probably therefore the most exciting sport, fatal accidents being only too frequent. The least exciting of the four is the sitting up over the "kill," on a *machan*, or platform, built in some convenient tree; but where the forest is dense, or elephants are unobtainable, it is frequently the only practical mode of procedure. In districts where beating is the custom, natives are usually very chary of giving any information as to the whereabouts of "stripes," partly in order that they themselves may not be impressed to take part in the *hank*, or drive, and partly also from the fear that if they do so, they will fall a victim either to the wounded tiger, if it escapes, or to its companion, upon whom the office of *vendetta* is supposed to devolve. And here it may be mentioned that in many parts of India the natives will never mention the tiger by its proper title, but use some other term, as, for instance, the native name of the jackal. This is due to some superstition that the mention of the name will lead to the death of the speaker.

Beating for tigers is much practised in Central and Southern India, where these animals are commonly found in densely-wooded ravines, of which the banks are often high and precipitous. On the other hand, beating with elephants is chiefly employed in the tall grass-jungles of the Terai and Assam, where any other mode of hunting would be almost impracticable. In the swampy Sandarbans of Lower Bengal, where the tigers lead a semi-aquatic life, they must either be walked up on foot, or shot from a *machan*, unless, indeed, the sportsman is lucky enough to "pot" his game from a boat.

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THE INDIAN LEOPARD

(*Felis pardus*)

NATIVE NAMES.—*Chitu*, *Sona-chita*, *Chita-bagh*, *Adnara*, AND *Tendwa*, HINDUSTANI; *Palang*, PERSIAN; *Diho*, BALUCHI; *Suh*, KASHMIRI; *Tidua* AND *Srighas* IN BUNDELKAND; *Gorbacha* OR *Borbacha*, DECCANI; *Karda*, *Asnea*, *Singhal*, AND *Bibia-bagh*, MAHRATHI; *Tenderwa* AND *Bibla* AMONG THE BAURIS OF THE DECCAN; *Houiga* AND *Kerkal*, CANARESE; *Teon-kula* OF THE KOLS; *Jerkos* AMONG THE RAJMEHAL HILL-TRIBES; *Burkal* AND *Gordag* OF THE GONDS; *Sonora* OF THE KORKUS; *Chiru-thai*, TAMIL; *Chinna-pali*, TELEGU; *Pali*, MALABARI; *Kutiya*, CINGALESE; *Bai-hira*, *Tehr-he*, *Goral-he*, OR *Ghor-he* OF THE HILL-TRIBES OF THE SIMLA DISTRICT; *Sik*, TIBETAN; *Syik*, *Syiak*, OR *Sejjiak* OF THE LEPCHAS; *Kajengla*, MANIPURI; *Misi-patrai* AND *Kam-kei* OF THE KUKIS OF THE MISHMI HILLS; *Hurrea-kon*, *Morrh*, *Rusa*, *Tekhu-Khuia*, AND *Kekhi* OF THE NAGAS; *Kya-lak* OR *Kya-thit*, BURMESE; *Klapreung*, TALAIN; *Kiche-phong* OF THE KARENS; *Rimau-bintang*, MALAY

(PLATE VIII. FIG. 3)

Among the numerous instances of confusion and uncertainty as to the proper application and signification of names in natural history, perhaps no greater "muddle" exists than in the case of the large spotted cat whose scientific title is undoubtedly *Felis pardus*. As is stated in the article "Leopard" in the ninth edition of the *Encyclopædia Britannica*, as well as in Mr. R. A. Sterndale's *Natural History of Indian Mammalia*, this animal was known to the ancients by the names of *pardalis* and *panthera*, which subsequently became Anglicised into pard and panther. At the same early date the animal now known as the hunting-leopard was designated *leo-pardus*, or leopard, from the idea that it was a hybrid between the lion and

the pard. As time went on, the name "pard" gradually fell into disuse, and the term leopard became transferred from the animal to which it originally belonged to one of the varieties of *Felis pardus*, panther being, however, still retained for another form of the same animal, on the supposition that there were two distinct species of these spotted cats.

This transference of the name leopard to *Felis pardus* left the animal to which it originally pertained without a popular title of any kind. Accordingly the Hindustani name chita (meaning spotted or speckled) was made to do duty for the animal in question. Such a restriction is, however, quite unjustifiable, for although by the natives of India the latter title is applied indifferently to *Felis pardus* and *Cynelurus jubatus*,¹ in almost ninety-nine out of every hundred occasions on which it is employed, the former animal will be the one designated. Sometimes, indeed, it may happen that if a native of India wishes to particularise the exact kind of chita to which he may be referring, he will distinguish *Felis pardus* either as sona-chita (golden chita), or as chita-bagh (spotted tiger), but on nearly all occasions chita suffices.

The best way out of the double difficulty is to drop the use of the term chita altogether, and to call *Cynelurus jubatus* the hunting-leopard, while the term leopard is assigned to *Felis pardus*.

But here another difficulty presents itself. The majority of Indian sportsmen are persuaded that, in addition to the hunting-leopard, there are two perfectly distinct species of large spotted cats, which they respectively call leopard and panther. And it is a matter for regret that the idea of the specific distinctness of the animals so designated has been supported by such a good naturalist as Mr. Sterndale. It may, however, be regarded as certain that the animals in question are at most but varieties of a single species, of which they not improbably indicate a larger and a smaller race.

¹ To avoid hopeless confusion in this connection, it is almost essential to use the scientific names of the two animals.

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Accordingly, it is justifiable to use only a single English name for this species, although we may mark the occurrence of two races, if such really exist, by designating one as the lesser, and the other the larger Indian leopard, the name "panther" being allowed to fall, so far as possible, into oblivion.

Having cleared the ground thus far, the next point is the definition of the animal it is agreed to call the leopard (*Felis pardus*). Briefly, it may be said that under this term are included all the varieties of large ring-spotted cats inhabiting the Old World, with the exception of the snow-leopard, of which the distinctive features are pointed out in the sequel. From the hunting-leopard, the present species, in addition to the difference in general bodily form and the structure of the claws, is broadly distinguished by the circumstance that a large proportion of the spots on the back and sides are in the shape of large circular broken rosettes, whereas all those of the former animal are solid and smaller. The only other cat with which the leopard is the least liable to be confounded is the jaguar of the New World, which is recognisable at a glance by the presence of a small black central spot to each rosette, of which there is no trace in the leopard.

In size the leopard, as might be expected from its wide geographical distribution, is a very variable species, the extremes of total length ranging from as little as five to as much as eight feet, or thereabouts. The general ground-colour of the upper-parts varies from olive through rufous to pale yellow or brownish yellow, and that of the under-parts from yellow to pure white. The black spots on the head and lower part of the limbs are always small and solid; and such solid spots may be continued on to the neck and shoulders, as well as in a double line down the middle of the hinder part of the back, while the greater portion of the outer surface of the limbs may occasionally be solid-spotted. Over a larger or smaller extent of the upper surface of the body and outer side of the upper portion of the limbs the spots take the form of rosettes, consisting of a

black, and frequently interrupted external ring, and a pale centre, which may or may not be darker than the general ground-colour. On the under-parts the spots are solid, and often lighter-coloured than those of the back, being generally also much larger and more irregularly shaped than those on the head. On the upper surface of the tail the spots are elongated and light-centred; but towards the tip of the upper surface they assume the form of broad transverse bars, the under surface of the tail-tip being uniformly yellowish or white.

Marked local differences in bodily form and in the length of the tail and hair are likewise noticeable, the Manchurian race being a much more heavily-built and longer-haired animal than the leopard of Bengal.

The distribution of the leopard is very extensive, including the greater part of Africa, Asia Minor, the Caucasus, Syria, Palestine, Persia, Baluchistan, Afghanistan, a large part of Central Asia, India, Assam, Ceylon, Burma, the Malay Peninsula, Siam, China, Manchuria, Java and Sumatra.

With this enormous geographical range, it is only natural to suppose that the leopard should be divisible into a considerable number of local races. And that this is the case may be regarded as certain, although unfortunately the specimens in our museums are at present insufficient to enable the determination and definition of such local races to be properly worked out.

The first point in connection with an investigation of this nature is to determine the locality of the typical *Felis pardus* of Linnæus, by whom the species was originally named. In the *Systema Naturæ* the first reference is to the figure of an African representative of the species, and this might at first sight be taken to indicate that the typical leopard is the African form.¹ But at the conclusion of his brief notice Linnæus gives the habitat of the species as *in Indis*; and since the description speaks of all the spots

¹ This appears to have been the view taken by the French naturalist Temminck.

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on the upper surface being annulated, this accords much better with the Indian than with the African animal.

African leopards are characterised by the spots being very numerous and of comparatively small size, and more especially by the circumstance that the whole or the greater portion of those on the fore part of the body—that is to say, about as far back as the hinder side of the shoulders—are in the form of irregular solid spots, the rosettes not making their appearance till behind the shoulder-blades.¹ Frequently, too, these solid spots tend to continue for some distance down the middle line of the back; and the great majority, if not the whole of the spots on the limbs, are of the solid type, although larger than those on the shoulders. These features are well displayed in the figure on page 297. As a rule, the middle line of the back is marked by a broad dark streak, and the centres of the rosettes are elsewhere not conspicuously darker than the general ground-colour. In a few skins the rosettes all over the body tend to break up into small irregular spots. It may be added that it is occasionally difficult to decide whether a particular skin is Indian or African, although there is no difficulty at all in determining the locality of a series.

Another important point is that there are no truly black leopards in Africa. Occasionally, however, specimens are met with on the high grounds of South Africa in which practically the whole of the rosettes are broken up into minute, widely separated spots, while the ground-colour is much darker than usual and the middle line of the back almost completely black. In one such specimen the semi-blackness of the back extends over the whole of the upper-parts, although the spots are still more or less distinctly visible. It may be added that African leopards appear to run comparatively small.

In East African specimens the ground-colour of the skin is generally a light golden tawny, with the under-parts and the inner surfaces of the

¹ Occasionally some of the spots in the region of the shoulders show small light centres.

limbs white. On the other hand, leopards from the moist forest region of the west coast are very much darker, the ground-colour of the upper-parts being olive-tawny, and that of the lower-parts yellow-tawny.

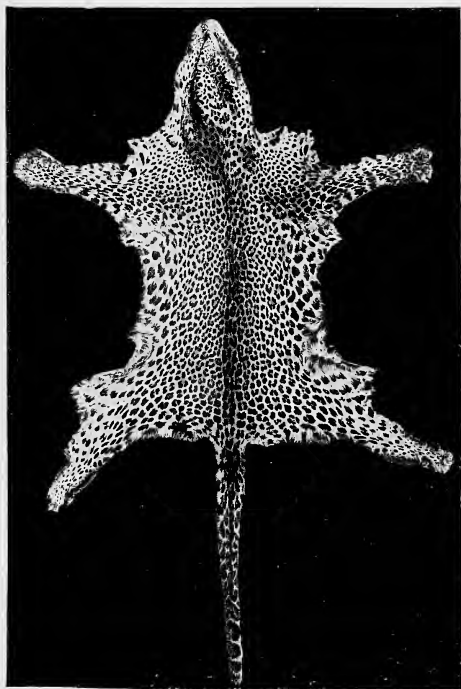


FIG. 56.—Skin of African Leopard. (From Dr. Bonavia's *Studies in the Evolution of Animals*.)

In the year 1777 Erxleben applied the name *Felis leopardus* to the African leopard, and in the absence of any evidence to the contrary, it may perhaps be permissible to consider this form typified by the East African

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leopard, which should then be known (as being merely a variety of the species of which the Indian leopard is the type) as *F. pardus leopardus*. Admitting this, it next becomes a question whether the West African form should be included under the same sub-title. If we had only these two forms to deal with, the West African might certainly be separated as a distinct race. But since both forms agree in the general arrangement of their spots, and thereby differ from all the Asiatic representatives of the species, such a classification would not adequately express the relationships of the different modifications. It would, indeed, require a quadrinomial system to properly indicate such distinctions, but since this is not yet adopted in zoology, it seems better for the present to regard all the African leopards as belonging to a single race, of which the eastern form may be designated as *Felis pardus leopardus, a*, and the western as *F. pardus leopardus, b*.

Turning to Asia, it will be found that all Indian leopards have the spots larger, less numerous, and more widely separated than in the African animal, while the rosettes extend forwards on the back as far as the hinder region of the neck, and likewise reach some way down the upper region of the limbs.¹ In no case does the middle line of the back form such a conspicuously dark streak as in the African leopard, and in many skins there is no appreciable darkening in this region at all. Individual specimens, more especially in the Malay countries, are, however, completely black, so that the spots and rosettes are visible only in certain lights. Frequently the centres of the rosettes on the back are appreciably darker than the general ground-colour. As regards the length of the fur and the thickness of the tail, Indian and African leopards are very similar, the fur on both body and tail being short and close.

These differences are amply sufficient to justify the separation of the

¹ These features are well shown in the figures of Chinese leopard skins on pp. 16 and 17 of Dr. Bonavia's *Studies in the Evolution of Animals*.

Indian leopard as a race apart from the African representative of the species, and as it has already been shown that the Indian leopard is the

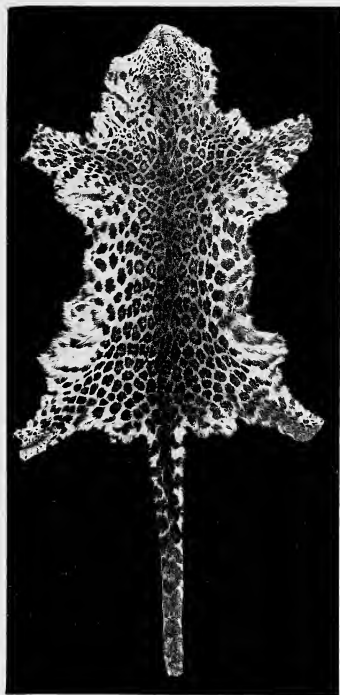


FIG. 57.—Skin of Indian Leopard. (From Dr. Bonavia's *Studies in the Evolution of Animals*.)

typical representative of the species, its full title will be *Felis pardus typica*. But, as has already been indicated, Indian leopards are by no means all precisely alike (although differing in all the above features from their

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African relative), sportsmen recognising a larger form, which they call panther, and a smaller one, to which they restrict the title leopard. It appears that the lesser Indian leopard, which is the one generally met with in the plains of Peninsular India, is characterised by the relatively small size of the rosettes, the pale tint of the ground-colour, and the absence of darkening in the central area of the rosettes, these features being generally accompanied by a greater length of tail and a shorter head. On the other hand, in the larger Indian leopard, which is generally found in the damp forest regions of Bengal, Assam, the Terai, Burma, and probably the Malay countries, the ground-colour of the fur tends to reddish, the central areas of the rosettes are darker than the rest of the fur, and the tail is relatively short and the head long. A mounted example of this form is exhibited, in a crouching attitude, in the British Museum. Although in a large series of specimens it may be difficult to assign individual skins and skulls to one or the other, if the two forms are, as a whole, distinguishable and restricted to particular localities, they are undoubtedly entitled to recognition. But in view of what has been said with regard to the two colour-phases of the African leopard, there are inconveniences in the way of regarding them as races. Accordingly, it is proposed to include them both under the title of *Felis pardus typica*, taking the larger form, which may be designated *a*, as the type of that race, and distinguishing the smaller animal as *b*. The above-mentioned mounted specimen may be taken as a typical representative of the larger form of the Indian race, and therefore of the species.

The Indian leopard, as already mentioned, probably extends into the Malay countries and the south of China. In Baluchistan, Persia, etc., it is replaced by a distinct race, of which the characteristics are given under a separate heading. In Manchuria the species is represented by an extremely different race (*F. pardus foutanieri*), which presents features analogous to those of the Manchurian tiger, as compared with its Bengal

relative. The Manchurian leopard, of which a fine mounted example is exhibited in the British Museum, is much more distinct than either of the other local races of the species, presenting, indeed, the extreme of divergence from the small-spotted African race.

In its general massiveness of build the Manchurian leopard is indeed very similar to the tiger of the same region, having stout and somewhat clumsy limbs, a relatively short and broad head, and long and thick fur.

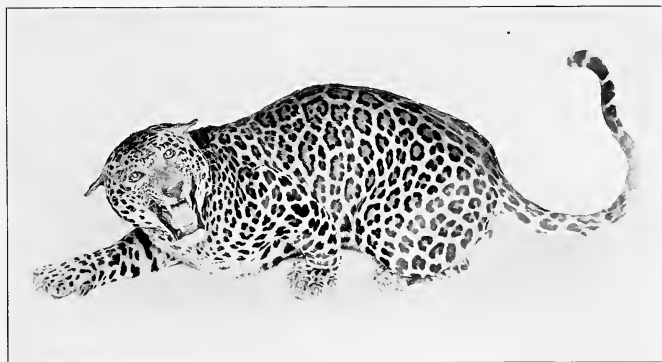


FIG. 58.—Indian Leopard.

Another analogy to the Manchurian tiger is presented by the type of coloration, the spots being very much larger and more widely separated from one another than is the case with the Indian leopard. The ground-colour of the fur is very pale sandy, but the light centres of the rosettes, especially on the back, are very much darker than the general body-colour. The solid spots of the head are continued on to the region of the shoulders, and thence down the whole of the fore-limbs, similar solid spots reappearing on the hind-legs. These large spots are widely separated from one another, and nearly circular in shape, and are thus markedly

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different from the small, closely-crowded, and irregular solid spots on the fore-quarters of the African leopard, while they are equally different from the annulated spots occurring in the same region of the Indian race of the species. The dark rings are, in fact, much less broken up than in either the Indian or the African race. A leopard skin from Shensi, Northern China, recently presented to the British Museum by Father Hugh, seems to be intermediate between the Manchurian and large Indian race. It has the long hair and thick tail of the former, but resembles the latter in the rich tawny ground-colour of the fur, and also in the prevalence of rosettes, especially on the hind-quarters.

Black leopards, it may be observed, are not entitled to be regarded as a distinct race, being only specially coloured individuals of the larger Indian leopard, which, as already mentioned, is the form found not only in Bengal but apparently also in Burma and the Malay countries. Hot, moist forest districts are indeed those most favourable to the development of melanism among leopards, Travancore and the south of India generally being the regions on the west of the Bay of Bengal where these "sports" are most common, while to the east they are still more abundant in Lower Burma and the Malay countries. In a paper contributed to the *Zoologist* for 1898 Colonel F. T. Pollok suggests that the reason for the prevalence of melanism in the latter district is that the leopards there habitually prey on gibbon apes, and that their sombre coloration renders them more inconspicuous than if they were spotted. He even goes so far as to say that under such conditions a leopard of the ordinary colour would starve. But this implies that all Malay leopards are black, which is certainly not the case; and it is also more than doubtful whether, in the case of an animal creeping along the arm of a tree, a uniformly black colour would not be more conspicuous than the ordinary spotted coat of the leopard. A white (albino) leopard has been recorded by Buchanan Hamilton.

The most essential difference between the habits of the leopard and

the tiger is the facility with which the former animal can ascend trees; indeed, in some of the forest districts where its prey consists largely of monkeys, it may become an almost completely arboreal creature. This arboreal habit renders the leopard a more cunning animal than a tiger, since, when approaching a "kill," it is stated to invariably scan the boughs above, whereas a tiger only does this when it has learnt caution from having been fired at from above on a previous occasion. It has been already mentioned that whereas a tiger always commences its meal by tearing at the hind-quarters of its victim, a leopard begins operations on the fore-quarters and viscera.

Leopards are on the prowl for prey throughout the night, dogs being their favourite victims in the neighbourhood of human habitations, while, as already said, in many forest districts they subsist chiefly on monkeys of various kinds. When a leopard takes to man-eating, it is even more to be dreaded than a tiger with similar propensities, since it will frequently not hesitate to burst through the frail walls of native huts and seize the inhabitants as they lie asleep. Colonel Pollok tells us that in certain portions of the Nizam's dominions the average deaths from man-eating leopards reached one *per diem*, while in others they were as many as two daily! Even shikaris posted on platforms (*machaus*) in trees have been carried off by the stealthy approach from behind of the very animals for which they were lying in wait.

In many parts of India the favourite haunts of leopards are rocky, scrub-clad hills, containing numerous clefts and caverns, in which they make their lairs. Water is much less essential to their well-being than is the case with the tiger, and they are not unfrequently found in completely dry districts in India, while in Somaliland they commonly dwell in such situations. In India, at any rate, these animals are generally found in pairs, and the cubs are born during February or March, the number in a litter being usually from two to four, although Colonel

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Pollok states that he has heard of as many as seven. It is a curious fact in connection with leopard cubs that the spotting is much less distinct than in the adult, the general colour being brownish. This is precisely the reverse of what occurs in the lion. As a rule, the leopard is a silent animal, although when charging it utters a short growl. Those best conversant with its habits in a state of nature state, however, that when on the prowl it occasionally gives vent to a harsh cry, quite different to the roar of a tiger, and somewhat intermediate between a grunt and a cough.

Although leopards were at one time hunted by the troopers of the Central Indian Horse by beating them out from patches of sugar-cane during the rainy season with the aid of a pack of dogs and then spearing them, while they are often speared by parties of two or three mounted Europeans, the more general plan is either to watch for them by night in a *machan* over a tethered bait or a "kill," or to drive them from covert with a line of beaters. Machan-shooting is weary work, and requires a large stock of patience on the part of the lonely watcher. As leopards usually go in search of water between seven and eight in the evening, and again between five and six in the morning, it is at such times that they most frequently approach the bait, the majority of tethered baits being seized between the time of sunset and an hour after. In the dim twilight the spots of the leopard harmonise so exactly with the speckled shade of the surrounding foliage that, unless the watcher makes the best use of his eyes, the marauder will be only too likely to have sprung upon the bait before its presence is even suspected.

The following hints on machan-shooting are given by an anonymous writer in *The Asian* newspaper of 27th February 1900 :—

"If you have had a kill, go early to your *machan*, and take the precaution to have the kill securely tied or hung to some fixed object, or you may find the panther carry it off without giving you a chance.

“If you are to sit over a live goat, see first that the *machan* is so constructed as to give you the advantage of rising ground if there be any. Take care that the rope of the goat is not too long, or you will find it perhaps difficult to get a shot from your circumscribed look-out hole. If there is a little moonlight expected after dusk, try and arrange your *machan* so as to have the light falling from behind you on to the goat. Recollect the shadow cast by the moon. It is not always easy to distinguish the shadow from the substance of the goat, and the same is of course true of the panther. Take your time in aiming, and if the panther is inextricably mixed up with the goat, wait. Eventually the panther will conquer the goat and give you a steady shot while sucking the blood from the neck.

“Don’t fancy the panther will not come, once you have made up your mind to sit up. Some are exceedingly crafty and suspicious, and do not fail to observe the goat most carefully. Often the goat ceases bleating simply from an access of fear; it has seen, heard, or scented the panther. You will often see it, after standing or lying carelessly, suddenly assume a rigid position, gradually moving its head round, and sometimes by the action of its legs unmistakably indicating that the foe is about. The goat will sometimes stamp on the ground and emit little snorts. Of course occasionally this may only indicate a hyæna, or a pig, or the insignificant mongoose, or a hare, but never neglect such indications.

“As to using slugs, I think you will do well to have a smooth-bore loaded with buck-shot. But stick to your rifle to the last possible moment. Slugs do not always penetrate between the ribs and reach a vital part, and they seldom leave a bloody trail. I have rarely found my .500 Express fail even when it was impossible to see the sights.”

THE PERSIAN LEOPARD

(Felis pardus panthera)

(PLATE VIII. FIG. 4)

In his work on the animals of Russia and Asia, published in 1811, Pallas gave the name of *Felis panthera* to the leopard of the Caucasus. And although he did not clearly distinguish it from the true *F. pardus* of Linnæus, with which indeed he appears to have regarded it as identical, yet according to modern usage his name is entitled to stand for the Persian and Caucasian race of the leopard. The name of this form will consequently be *Felis pardus panthera*. It should be added, however, that in 1856 the French naturalist Valenciennes gave the name of *Felis tulliana* to the Persian leopard (ignoring the priority of the name *panthera*¹); and in consequence of this the race has been very generally known as *F. pardus tulliana*. If it were possible to distinguish the Caucasian from the Persian leopard (which does not seem to be the case), the name *F. pardus panthera* would of course stand for the former and *F. pardus tulliana* for the latter.

The geographical range of the Persian leopard appears to extend from the Caucasus and Anatolia through Persia and Baluchistan to the hills of Sind. The animal may be distinguished from the Indian leopard by its much longer fur, thicker tail, and certain details of coloration, being in these respects to a considerable degree intermediate between the latter and the snow-leopard. A fine skin of this race from the Caucasus was described by the present writer in the Zoological Society's *Proceedings* for 1899; the description being accompanied by a coloured plate of the animal. From the small size of this plate the animal does not, indeed, appear very markedly different from an ordinary Indian leopard, but when skins of the two are

¹ Mr. Sterndale proposed to call the larger Indian leopard *F. panthera*, which is totally unjustifiable.

laid side by side, the distinction is very apparent. Compared with an Indian leopard's skin the Caucasus specimen is at once distinguishable by the irregular formation and small size of the rosettes, in which the centres are not appreciably darker than the general ground-colour, as they are in the larger form of the Indian race. From the head to the shoulders the spots are solid, somewhat like those of the African leopard. The fur, which is relatively long all over the body, becomes still more markedly so on the under surface of the body, where it is pure white, with solid elongated spots of large size, but widely separated from one another. In this respect the specimen is decidedly nearer to the Indian than to the African race, in the latter of which the spots on the under surface of the body are generally so large as to leave only a network of light ground between them. In the double line of solid elongated black spots down the middle of the hinder half of the back, there is, however, an approximation towards the African type. The very long and bushy tail, the terminal third of which is black and white only, is strikingly like that of the snow-leopard.

It is a matter of some interest to ascertain in what part of India the Persian race is replaced by the Indian, and likewise whether there is a complete gradation between the two. The writer has in his own possession a leopard-skin purchased in Kashmir which is evidently nearer to the Persian than to the Indian race, but which may indicate a partial transition between the two. Observations on the coloration and length of the hair in Kashmir leopards would therefore be of much interest to naturalists.

A fine mounted specimen of the Persian leopard, obtained from Astrabad, in Persia, and presented by Colonel Beresford-Lovett in 1882, is now exhibited in the British Museum. In the thick and furry tail, as well as in general coloration, it presents a marked contrast to the crouching specimen of the larger Indian leopard, mounted by Rowland Ward, exhibited in the lower part of the same case.

THE OUNCE, OR SNOW-LEOPARD

(Felis uncia)

NATIVE NAMES.—*Ikar*, *Zig*, *Sachak*, AND *Sah*, OF THE BHOTIAS OF TIBET ;
Bharal-hē OF THE HILL-TRIBES NORTH OF SIMLA : *Thurwagh* IN
 KUNAWAR

(PLATE VIII. FIG. 5)

Although often confounded by sportsmen with the long-haired Persian race of the true leopard, the snow or white leopard is a perfectly distinct species ; it was formerly regarded as a very rare animal, but skins may now be frequently seen in the windows of the London furriers, and a few years ago an adult living specimen was exhibited for some time in the Zoological Society's Menagerie. By Anglo-Indian sportsmen the animal is almost invariably designated the snow-leopard ; but by the older travellers and naturalists it was commonly termed the *Ounce* or *Onza*,—names said by Buffon to be corrupted from *Lynx* or *Lunx*, of which animal the present species was supposed to be a near relative. The same name occurs again in the scientific title of the jaguar, *Felis onca*. The name *Bharal-hē*, bestowed on the snow-leopard by the hill-tribes to the northward of Simla refers to its partiality for the mutton of the blue sheep or bharal.

The snow-leopard is specially characterised by the length and thickness of the fur, which attains its maximum development on the tail. The ground-colour of the fur is white, and the black spots, except on the head, are larger and more ill-defined than in the leopard, forming large interrupted and somewhat irregular rosettes, with the light area inside each of a somewhat darker tint than the general ground-colour. On the head and limbs, as well as in the terminal third of the tail (where they form rings) the spots are solid, that is to say, without light centres ; and on the under

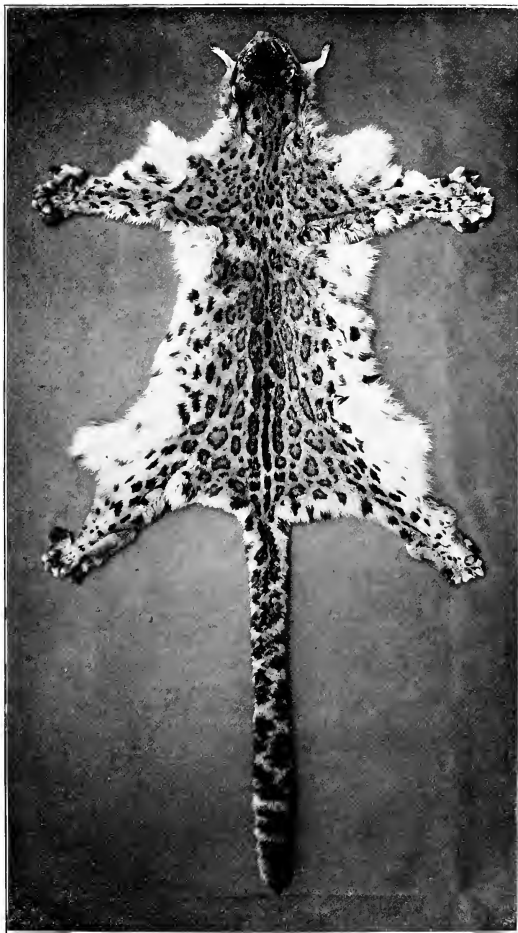


FIG. 59.—Skin of Snow-Leopard.

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surface of the body they are comparatively few, and these somewhat ill-defined. A dark longitudinal streak runs from near the middle of the back to the root of the tail; and the black external surfaces of the ears are each marked by a large yellowish spot.

In height the snow-leopard stands about 24 inches at the shoulder; and, although precise dimensions are very difficult to obtain, its total length would appear to range between 6 and 7 feet, or perhaps rather more. In a specimen of which the total length is 6 feet minus half an inch, the tail measures 36 inches; but this appendage has also a similar length in an example of which the entire length is 6 feet 4 inches. The skull, which measures from 6 to 7 inches in length, can be readily distinguished from that of the leopard by the more swollen palate, and the shorter nasal bones, approximating in the latter respect to the cranium of the lion.

The snow-leopard, as its name implies, is essentially an inhabitant of high mountains, and is found on all the elevated ranges of Central Asia, occurring not only in the neighbourhood of the snowy range of the Himalaya, as well as in Ladak and Tibet, but extending in a north-westerly direction to Gilgit, Hunza, and Nagar, and being likewise met with in Turkestan, Trans-Baikalia, Amurland, and North-Western China. Its reported extension into Persia is, however, more than doubtful, and its alleged occurrence in the Caucasus is due also to specimens of the Persian variety of the leopard having been mistaken for this species. Although usually found at elevations above 8000 feet (and probably ascending to 18,000 or 20,000 feet), in winter it descends as low as about 6000 in the Gilgit district.

Beyond the fact of its living for the most part in open, and frequently snow-clad country (for which its coloration is doubtless specially adapted), there does not appear to be much calling for special mention in the habits of this species, although it must be acknowledged that our information on this subject is far from being as full as is desirable. Comparatively few

specimens are seen by European sportsmen, and still fewer bagged. The present writer once had a good view of one of these animals ascending a hill at some distance off in Ladak, and Mr. Darrah relates how on one occasion in the same district he suddenly came across a snow-leopard lying on a rock, although only the head and a portion of its thick tail were visible. This animal had recently killed a bullock, of which the carcase lay near by, and, after the manner of the Indian leopard, it returned to the "kill" in the evening, although Mr. Darrah was not fortunate enough to add its skin to his trophies.

Away from the neighbourhood of human habitations the prey of the snow-leopard comprises bharal, shapu, young argali, ibex, and probably an occasional chiru and goa gazelle. Near villages, however, or in the vicinity of Tatar encampments, the animal turns its attention to domesticated sheep, goats, ponies, and occasionally, as in the instance mentioned above, cattle. Whether it displays the same partiality for dog-flesh as the ordinary leopard, is not recorded, but if so it must have some difficulty in gratifying its taste, as the mastiffs which guard Tibetan encampments and villages, and are the only dogs in the country, are awkward customers for even a leopard to kill and carry off.

THE CLOUDED LEOPARD

(*Felis nebulosa*)

NATIVE NAMES.—*Pungmar* AND *Sarchack* OF THE LEPCHAS ; *Zik* OF THE LIMBU OF NEPAL ; *Kang* OF THE BHOTIAS ; *Lamchitia* OF THE KHAS TRIBE OF NEPAL ; *Thit-kyoung*, BURMESE ; *Arimau-dahan*, MALAY

(PLATE VIII. FIG. 6)

A much rarer animal than the last is the beautiful but considerably smaller cat commonly known as the clouded tiger, although better desig-

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nated by the title given above, unless its Malay name (meaning "tree-tiger") is preferred. Indeed most of what is known of this species in the wild state is derived from native sources, which are frequently more or less unreliable, but it appears to have been seen in its natural haunts by Mr. Charles Hose in Borneo.

The clouded leopard is indeed essentially a Malay animal, inhabiting the Malay Islands and Peninsula, and thence extending through Burma into Assam and the Sikkim and Nepal Himalaya. Consequently the Indian sportsman has but comparatively little opportunity of invading its haunts. The species has a special claim on the interest of the naturalist on account of the unusually great relative length of its upper tusks, or canine teeth, which in this respect come nearer to those of the extinct sabre-toothed tigers (*Machærodus*) than is the case in any other living member of the cat tribe.

In size the clouded leopard may be compared to a very small specimen of the common leopard, its total length ranging between 6 and $6\frac{1}{2}$ feet, of which from 2 feet 6 inches to about 3 feet is taken up by the long and thickly haired tail. The coloration may be regarded as a modification of the type found in the snow-leopard; for if we imagine the dark rosettes of the latter diminished in number and greatly extended in size, so as to form large blotches with dark margins and centres of a somewhat deeper shade than the general ground-colour, we should have the "clouded" pattern met with in the present species. The ground-colour of the fur is some shade of pale yellowish-grey, upon which are the dark blotches or patches, which exceed a couple of inches in diameter, and are frequently edged in part, especially on the hinder border, with black. In aged individuals the blotches themselves tend more or less completely to disappear, leaving little or nothing more than their broken black margins. The upper surface of the head is ornamented with solid black spots; and two broad black bands, separated by narrower streaks or rows of elongated spots, run

from the ears to the shoulders, to be continued as more or less ill-defined lines of oval spots along the middle of the back. The cheeks have the two black stripes so common among the smaller cats, and the margins of the upper lip may be also black, while the black of the outer surface of the ear is frequently relieved with a central grey spot. The tail is ornamented with a series of dusky rings, frequently imperfect on the sides, and connected along the upper surface of the basal portion by a dark longitudinal stripe. As already mentioned, the tail is typically of great relative length—frequently nearly as long as the head and body—but in the island of Formosa there is a much shorter-tailed race of the species, known as *Felis nebulosa brachyurus*.

As is indicated by its Malay name, the clouded leopard is an arboreal animal; and its food appears to consist of small mammals and birds, for which it lies in wait on the branches of trees. In Borneo it occurs both on the plains and in the mountains up to an elevation of 5000 feet, and in the Himalaya it does not appear to range higher than about 7000 feet. If taken young, it can be easily tamed, and it has been several times exhibited in the London Zoological Gardens. The marbled cat (*Felis marmorata*), of the Eastern Himalaya, which may be described as a miniature replica of the present species, can scarcely claim to be regarded as a game animal.

THE GOLDEN OR BAY CAT

(*Felis temmincki*)

As being a larger animal than the one just mentioned, as well as from its peculiar type of coloration, the golden cat can scarcely be passed over without a brief notice. Of rather inferior size to the clouded leopard (length of head and body 31 inches, of tail 19 inches), this species is

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specially distinguished by its uniformly coloured coat, which, except on the face, lacks both stripes and spots. The colour varies from bright rusty red to dark brown or grey, the cheeks and forehead being streaked with white and brown, and faint traces of spotting occasionally showing themselves on the flanks and the under surface of the body. The geographical range of this cat extends from Nepal and Sikhim, in the Eastern Himalaya, at moderate elevations, through the hills of Tippera, to Burma, and so on by way of the Malay Peninsula to Borneo. A skin of the grey phase of this species, shot in Upper Burma, has been recently presented to the British Museum by Mr. C. W. A. Bruce.

THE FISHING-CAT

(*Felis viverrina*)

NATIVE NAMES.—*Banbiral*, *Bardeen*, *Khupya-bagh*, AND *Bagh-dasha*, HINDUSTANI ; *Mach-bagral*, BENGALI ; *Handun-dīva*, CINGALESE

(PLATE VIII. FIG. 7)

It has often been a matter of speculation why the ordinary domesticated cat should display such a marked partiality for a fish diet, and yet be so averse to wetting its feet. And the problem is rendered no easier of solution by the fact that the present species (which slightly exceeds its domesticated relative in size) is endowed with the same taste, and has no hesitation in taking the necessary steps to gratify this desire. Nor has this fishing habit escaped the notice of the natives of India, its Bengali name being the equivalent of its English title.

The fishing-cat is a spotted species of somewhat larger dimensions than the under-mentioned leopard-cat, from which it differs by the grizzled grey fur of the body being marked by longitudinal lines of partially

connected dark brown spots, replaced on the hind-quarters by smaller black spots. The short and bushy tail, which is about one-third the length of the head and body, is marked on its upper surface by transverse bars of dark brown. Very characteristic of the species is the narrowness of the nasal bones of the skull, which form a sharp ridge.

This cat, which also inhabits the south of China and the island of Formosa, is found in Ceylon, India, Lower Burma, and Tenasserim. In India it has been recorded from the Indus Valley, the outer Himalaya, Nepal, Assam, and Bengal, and it may possibly occur also on the coasts of Malabar and Travancore, although it appears to be absent from the Central Provinces. Its fish-catching propensities have been already alluded to, and in order to exercise these the species generally takes up its residence in marshy situations, on the banks of swamps and rivers, where it also feeds on the large molluscs known as *Ampullariæ*. In spite of its comparatively small bodily size, it is a vicious creature, frequently levying toll on the poultry and such of the domesticated quadrupeds of the natives as it is able to destroy.

THE LEOPARD-CAT

(*Felis bengalensis*)

NATIVE NAMES.—*Chita-billa* (spotted cat), HINDUSTANI; *Ban-biral*, BENGALI; *Wagati*, AMONG THE MAHRATHAS OF THE GHATS; *Thit-kyoung*, ARAKANESE; *Kye-thit*, *Thit-kyuk*, and *Kya-gyuk*, BURMESE; *Kla-hla* OF THE TALAINS AND KARENS; *Rimau-akar*, MALAY

(PLATE VIII. FIG. 8)

Of all the smaller Indian felines the pretty little leopard-cat is perhaps the most abundant and most generally distributed. Compared with the

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fishing-cat it is a smaller and more "leggy" animal, being, in fact, somewhat inferior in size to an ordinary domestic cat, but with proportionately longer limbs. As regards colour and markings it is extremely variable, and consequently very difficult to describe; but since there is no other species with which it is liable to be confounded, such description need not, on the present occasion, be very detailed. Speaking generally, it may be said that the ground-colour of the fur of the upper-parts varies from yellowish grey to bright yellow; upon this are dark brown spots and streaks, which also extend on to the white under-parts, the extremity of the long tail being marked by black transverse bars. The majority of the dark markings take the form of more or less elongated spots, but there are a couple of dark bars on the inner side of each forearm, as well as two horizontal cheek-stripes, of which the lower may be joined with a horizontal throat-band, while there may be other more or less ill-defined stripes across the lower part of the throat and chest. On the forehead two pairs of longitudinal stripes run backwards over the head to the hinder part of the neck; and the middle pair of these stripes, which may be separated for some distance by other markings, are frequently continued down the back as a double row of spots. In addition to these dark markings, there is very generally a white streak running from the inner side of each eye to the forehead; and likewise a large whitish spot on the outer surface of each ear, the remainder of which is black. From 22 to 26 inches is the general length of the head and body of this pretty little cat, while that of the tail varies between 11 and 12 inches, or sometimes a little more.

Doubtless this very widely-spread species will eventually be found to be divisible into several local races or sub-species, of which it is highly probable that more than one may be found in India itself. And, indeed, as a matter of fact several names have already been proposed for different colour-phases of this highly variable cat. Such distinctions will have, however, but little, if any interest, for the average sportsman, and may

accordingly, on this occasion, be dismissed without further notice. It may be added, however, that in Southern India and Ceylon there is a smaller but perfectly distinct species known as the rusty-spotted cat (*Felis rubiginosa*). In addition to the circumstance of having one pair of teeth less in the upper jaw, the latter species is distinguished from the leopard-cat by the circumstance that the middle pair of the four longitudinal dark streaks on the forehead are continued as two simple slightly divergent lines or rows of spots between the shoulders, whereas in *F. bengalensis* there are never these two lines alone; moreover the upper surface of the tail is devoid of spots in *F. rubiginosa*.

In addition to an extensive range in China and the Malay countries, the leopard-cat extends from Burma through Assam to India, where it is found from the foot of the Himalaya to Cape Comorin, although apparently unknown in Ceylon. If its absence from the latter island be a fact, the species would appear to be a member of the Malay fauna which has entered India at a comparatively recent epoch. It is to a great degree a nocturnal and arboreal animal, frequently taking up its quarters in a hollow tree, and feeding upon small mammals and birds. Its disposition is extremely savage and spiteful.

PALLAS'S CAT

(*Felis manul*)

The wild cat inhabiting the arid deserts of Ladak and Tibet, and thence northwards through Mongolia to Siberia, is a species agreeing approximately in size with the preceding, but differing from all others met with in the area of which the present volume treats by its thick coat of long and soft fur, and short tail. The general colour of the fur is pale whitish or yellowish grey, with a few indistinct dark markings on the

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head and upper portions of the limbs, and some more clearly defined but widely separated narrow black transverse barrings across the hind-quarters, the tail being likewise ringed with black. From behind each eye a white streak, between a pair of black ones, runs downwards and backwards, and behind each ear is a black mark. The under-parts are white. About 21 inches is the usual length of the head and body, and that of the tail 10 inches.

Unlike the majority of the smaller cats, which dwell in forest or jungle, the present species makes its home among barren rocks, in the crevices of which it rears its offspring. Its prey comprises various small mammals and birds, especially the rodents known as picas. Its thick fur affords an adequate protection against the intense winter cold of its habitat.

THE INDIAN JUNGLE-CAT

(*Felis chaus affinis*)

NATIVE NAMES.—*Jangli-billi*, HINDUSTANI; *Khatas*, HINDUSTANI AND BENGALI; *Bamberal*, BENGALI; *Gurba-i-kuhi*, PERSIAN; *Baul* AND *Bhaaga*, MAHRATHI; *Berka* OF A HILL-TRIBE IN RAJMEHAL; *Mant-bek*, CANARESE; *Kada-bek* AND *Bella-bek*, WADARI; *Katu-pundi*, TAMIL; *Jurka-pilli*, TELEGU; *Cherru-puli*, MALABARESE; *Kyoung-tset-kun*, ARAKANES

(PLATE VIII. FIG. 9)

The jungle-cat is a widely-spread species of the genus *Felis*, ranging from North Africa and the Caucasus through Syria, Palestine, Transcaspia, Asia Minor, Persia, Baluchistan, and Afghanistan, to India, Ceylon, Assam, Burma, and the north-west of China. In size it somewhat exceeds an ordinary domestic cat, and it may be very easily distinguished from all

other species by the almost or completely uniform tawny colour of the fur of the body, and the extreme shortness of the tail, which is less than one-third the total length of the animal. The ears are tipped with a few long black hairs, which are, however, scarcely sufficient to form a distinct pencil. Their presence, however, serves to indicate the near affinity of the jungle-cat to the lynxes, with which it agrees closely in the characters of the skull and teeth. Another special feature is to be found in the more or less reddish colour of the backs of the ears. The length of the tail varies from a third to two-fifths of that of the head and body. There are some remarkable local variations in the size of the teeth, as there also are in the colour of the fur.

Speaking generally, the colour of the fur of the head and upper-parts of the body may be described as varying from sandy or yellowish grey to greyish brown, the back being darker than the flanks, often with a rufous, and more rarely with a dusky tinge. Although the head and body are generally of a uniform colour, there are usually dusky bands across the limbs; and in some skins reddish stripes on the cheeks and a band of the same tint on the chest may be observable. Much more rarely indistinct vertical rows of spots or wavy lines may be detected; and the occurrence of a perfectly black specimen has been recorded in India. The under surface of the body is tawny or reddish white. The foot and ankle are brown beneath; and the tail has a black tip, and several black rings in its terminal third. The ears generally have black tips, and although often foxy red, may be more or less grizzled.

For a long time it was supposed that there were no constant distinctive features between the jungle-cats of different countries; but in 1898 Mr. W. E. de Winton, in a paper contributed to the *Annals and Magazine of Natural History*, pointed out that the species may be satisfactorily divided into several local races, or sub-species. Since the species was first described upon the evidence of specimens obtained from the neighbourhood of the

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Caspian, it is evident that this region is the habitat of the true, or typical jungle-cat (*Felis chaus typica*) ; and it has been found that the same race extends into the Caucasus, Turkestan, and Persia, while it may not improbably also occur in Baluchistan and Afghanistan.

From this typical race the Indian jungle-cat, of which the full designation is *Felis chaus affinis*, may be readily distinguished by its slighter build, somewhat longer tail, and the bright foxy red colour of the back of the ears, which stands out in bold contrast to the tawny hue of the rest of the head. The skull, too, is proportionally narrower, and the teeth are relatively smaller, and much less crowded together. On the other hand, the Egyptian jungle-cat (*Felis chaus nilotica*), which closely resembles the typical race in form and colour, although of rather superior size, is readily distinguished by the darker and more grizzled ears, the colour of which does not form a bold contrast to that of the rest of the head, as it does in the typical and Indian races, in both of which the ears are foxy red, although brighter in the latter than in the former.

Another race (*Felis chaus pallida*) occurs in North-Western China, distinguished by its pale colour. But the most remarkable of all the local races of this widespread species seems to be the one from Palestine (*Felis chaus furax*), in which the teeth are of such disproportionately large size as to be but little inferior in this respect to those of a small female leopard. Concerning this very curious feature, Mr. de Winton remarks that "there is as little difference between the teeth of the Palestine chaus and those of a female leopard as there is between those of the European wild cat and the Indian chaus—in fact, the flesh-teeth are actually larger than those of the ocelot, and had the separate teeth been found fossil, they would have been put down to an animal of the size of a leopard. Therefore in this group of cats we have all the intermediate steps in size between the teeth of *Felis catus* (wild cat) and *Felis pardus*, though the animals themselves do not vary greatly in size and are not much larger than the former." It

would be extremely interesting to discover the reason for this remarkable increase in the size of the teeth in the Palestine jungle-cat.

The Indian jungle-cat presents nothing calling for special notice in its habits. It is very generally distributed over India, from a considerable elevation in the Himalaya to Cape Comorin, and it appears to be equally abundant in Ceylon and Burma. Himalayan skins may be distinguished from those obtained in the plains of India by the much greater length of the fur. This cat is decidedly less strictly nocturnal than the majority of its kind, Jordon mentioning that he has known one spring out and seize a peacock as it fell to the gun, while the present writer has seen a specimen walk out of a maize-field at mid-day. It is a destructive creature to the smaller kinds of game, both furred and feathered; and it occasionally directs its unwelcome attentions to domestic poultry. From three to four kittens is the usual number in a litter; and the female is said to breed twice a year. Hybrids between this species and domestic cats appear to be by no means rare.

THE DESERT-CAT

(*Felis ornata*)

A very short notice must suffice for this cat, as it is one of those species whose claims to admission in a work devoted to "game," are somewhat doubtful, its size being approximately the same as that of a domestic cat. The species is nearly allied to the jungle-cat, with which it agrees in the characters of its skull, and in the presence of a few long stiff hairs on the tips of the ears, forming incipient pencils; these hairs are, however, brown instead of black. It is further easily distinguished from the jungle-cat by the greater length of the tail, which reaches to the hocks, by the ears being coloured like the rest of the head, and by the fur being marked by numerous

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roundish black spots on a pale yellow ground. The under surfaces of the paws are black, and the terminal half of the tail is ringed with black. The cheeks are marked by a pair of horizontal brown stripes; and, as is often the case in the jungle-cat, there are two black transverse bands on the inner surface of the forearm, the outer surface of the limbs also showing dark cross-bars.

The desert-cat inhabits the open sandy districts of North-Western India, extending from Banda through the North-West Provinces to Agra, Sambhar, and Sind, where it is comparatively common. In Yarkand and Kashgar it is represented by what appears to be a closely allied local race (*Felis ornata shawiana*).

THE CARACAL

(*Felis caracal*)

NATIVE NAMES.—*Siyah-gush*, PERSIAN; *Karakal*, TURKI

(PLATE VIII. FIG. 10)

Both the names *Siyah-gush* and *Karakal* refer to the black ears of this animal, which form one of its most distinguishing features, when viewed from behind, *siyah* meaning black in Persian, and *kara* having the same signification in Turki. As other common instances of the employment of the same two words, we may note *siyah-posh*, for the black-clothed Kaffirs of Central Asia, and *karakorum* (black sand) as the name of a well-known pass on the route to Yarkand. The caracal is an animal with a very wide geographical distribution, its range extending from Africa through Palestine, Arabia, Syria, Taurus, Mesopotamia, and Persia, to Baltistan and India, as it also does into the Transcaspian countries. In Ceylon it is unknown; and in India, where it is everywhere rare, it is more abundant, as

might have been expected, in the western districts, such as Sind, Kutch, and the Punjab, although it is met with over a great part of the peninsula, in suitable localities. It is, however, quite unknown in the Eastern Himalaya and Bengal, as it also is on the Malabar coast. By the traveller Vigne it was stated to occur in the Upper Indus valley, and he gives *ech* as its Ladaki name. This term is, however, evidently the same as *ee*, which is there commonly used for the Tibet lynx; and if the animal was ever seen at all by that traveller in Baltistan and Ladak, it was probably in a state of captivity.

The caracal forms a connecting link between the jungle-cat and the true lynxes, its ears resembling those of the latter in being furnished with large tufts of long black hairs at their tips, but its tail is much longer than in the latter animals, and the throat and chest lack the distinctive lynx-ruff. Still the caracal is more of a lynx than a cat, its skull and teeth being distinctly lynx-like in character. In point of size the animal is intermediate between the jungle-cat and an ordinary lynx; but it is of remarkably slight and slender build, the limbs being proportionately long, and the tail, which reaches down to the hocks, about equal to one-third the length of the head and body. The height at the shoulder varies from 16 to 18 inches, the length of the head and body from 26 to 30 inches, and that of the tail between 9 and 10 inches.

No one can possibly fail to recognise a caracal at the first glance, its lynx-like ears, uniformly red colour, and comparatively long tail rendering it absolutely unmistakable. With the exception of the outer surface of the ears, a pair of spots on the upper lip, and sometimes others on the face, as well as, in some instances, the tip of the tail, which are black, and two pairs of pale spots in the neighbourhood of the eyes, the whole of the upper-parts and limbs are uniformly reddish, the tint varying from rufous fawn to brownish rufous. On the under-parts the colour varies from pale rufous to pure white, the inside of the ears being likewise white.

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Although it is but rarely that any traces of spotting can be detected on the back and sides of adult individuals, pale rufous spots are generally more or less in evidence on the light under surface of the body, and in the newly born kittens the whole coat is distinctly spotted. Individuals inhabiting desert districts are probably paler-coloured than those which live among grass and scrub.

The caracal may be regarded as a member of that section of the Indian fauna which attains its maximum development in Western Asia and Africa. It always frequents more or less open country, sometimes taking advantage of the cover afforded by bushes and long grass, but never that of forests. Perhaps its most distinguishing trait is its extreme agility, by which it is enabled to capture birds on the wing at a height of several feet above the ground, springing at them as they fly over its head, and knocking them over with a blow of one of its fore-paws. It likewise possesses a great turn of speed, which falls but little short of that of the hunting-leopard. Taking advantage of these attributes, the native chieftains of India have long been in the habit of training the caracal to capture the smaller deer and antelope, as well as hares, cranes, peafowl, etc. According to Vigne, who travelled in Kashmir and India between the years 1836 and 1840, the number of tame caracals then kept by some of the chiefs was very large indeed. Pairs of these animals were likewise frequently matched against one another to kill the greatest number out of a flock of pigeons feeding on the ground, the caracals springing suddenly into the midst of the flock and knocking down the birds before and as they rose to fly. In the wild state various kinds of game-birds, together with gazelles, hares, and the smaller deer, form the chief prey of the caracal ; the habits of these animals are, however, still very imperfectly known.

THE TIBETAN LYNX

(Felis lynx isabellina)

NATIVE NAMES.—*Patsalan*, KASHMIRI; *Ee* or *Ech*, LADAKI;
Tsogde IN BALTIKISTAN

(PLATE VIII. FIG. 11)

Although frequently regarded as a distinct species, there can be little doubt that the Tibetan lynx is nothing more than a pale-coloured local race of the ordinary lynx of Northern Europe and Asia, especially since there appears to be a more or less complete transition between the two forms in the Gilgit district. The reason for the paler coloration of the Tibetan lynx is not far to seek. Desert animals, in harmony with their environment, are always of a more sandy, or "isabelline," tone of colour than their relatives inhabiting grass-clad or forest districts. And since the ordinary lynx of Scandinavia and other parts of Northern Europe is a forest-dwelling creature, while its representative in Ladak and Tibet has to be satisfied, for the most part, with bare rocks as a dwelling-place, it is only natural to expect that there would be a marked difference in colour between the two.

But before going farther on this tack, it is advisable to say a few words regarding the lynxes in general, which are the most aberrant representatives of the genus *Felis*—so aberrant, indeed, that by some naturalists they are assigned a genus all to themselves. From the caracal, which is their nearest relation, the true lynxes differ by the abundant frill, or ruff, of long hair which fringes the throat and helps to give them their peculiar and striking personal appearance, and likewise by the shortness and "stumpy" look of the tail, which does not nearly reach as low as the hocks. The

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coat, too, is always more or less distinctly marked with small solid black spots, and the pads of the feet are clothed with a variable amount of hair. A generally "stilty" appearance is very characteristic of the lynxes, due to the relatively long legs and the short tail. The tufts of long black hairs surmounting the pointed ears have been already alluded to under the heading of the caracal. Certain characters distinctive of the skull will be found described in works of a more scientific nature than the present.

In the Tibetan lynx the general colour of the thick and soft fur is pale sandy grey, or isabelline, with the under-parts of the body white, and the extremity of the tail, the margins, tips, and tufts of the ears, together with a variable number of hairs in the throat-ruff, black. In the summer coat the whole tawny area is ornamented with the aforesaid black spots; but in winter these latter disappear from all parts except the limbs and flanks, and sometimes even there likewise. In rare instances black spots may be noticed on the white under-parts of the body in the summer. The Tibetan race is further characterised by the relative shortness of the hair on the toes.

This race inhabits the plateau of Eastern and Western Tibet, and certainly extends into Baltistan; but its exact geographical limits are impossible to define, because, as already mentioned, when we descend lower down the valley of the Indus, to the neighbourhood of Gilgit, where there is a certain amount of forest, the lynxes begin to assume a more rufous tinge, and thus imperceptibly pass into the typical European form, in which the colour may occasionally be rusty red. Seeing that in Scandinavia the lynx is a forest-dwelling animal, it is not a little remarkable that in the Kashmir territories the animal seems never to be found on the forest side of the snowy range in Kashmir itself, but is restricted to the bleak and arid country on the Ladak side of the passes. It is true that the creature has a Kashmiri name, but the same is the case with several animals not found in the vale of Kashmir, the Kashmiris being frequent

travellers into the adjacent districts, and often receiving consignments of skins from Ladak and other places.

Throughout its habitat, so far as accounts go, the Tibetan lynx is a rare animal, seldom seen, and still more rarely shot. The cubs are, however, occasionally taken by the natives of Ladak, Spiti, and Hanle, and the present writer once made the acquaintance of a tame specimen belonging to the Governor of Ladak. The Tibetan hares and blue pigeons form the chief prey of the lynx in Ladak, although it also levies toll on the smaller domesticated animals of the Tatars. In capturing pigeons the tame lynx above mentioned displayed an agility comparable to that described in the case of the caracal. Lynx cubs, of which there are generally two or three in a litter, are beautiful little "fluffy" creatures, and in Ladak are generally born in a crevice among rocks.

THE HUNTING-LEOPARD

(*Cynelurus jubatus*)

NATIVE NAMES.—*Chita* AND *Laggar*, HINDUSTANI; *Yuz* AND *Yuz-palang*, PERSIAN; *Chitra* OF THE GONDS; *Chita-puli*, TELEGU; *Chircha* AND *Sirungi*, CANARESE

(PLATE VIII. FIG. 12)

Neither of the two popular names in common use for this interesting animal is altogether a satisfactory one. The Hindustani *Chita*, which, like its Gond equivalent *Chitra*, means spotted, is also applied in India to the leopard, and, in fact, when a native uses that term, the probability is that he is referring to the latter animal. And with regard to the name "hunting-leopard," there is the great objection that the creature is not a leopard, either in structure or in coloration, being in fact the only existing member of the cat tribe that is unquestionably entitled to be classed in a

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genus apart from all the rest. To some of the older writers the animal was known as the guepard; and, whatever may be its origin, this name is altogether unobjectionable, but since it has become completely obsolete, it would be hopeless to attempt its revival. Of the other two names, hunting-leopard seems less liable to lead to confusion, and is accordingly recommended for general use.¹

From all the species—both cats and lynxes—included in the genus *Felis*, the hunting-leopard is broadly distinguished by the circumstance that it is unable to withdraw its claws entirely within the margins of their protecting sheaths, so that the points constantly remain exposed. The body, too, is more slender, and the limbs are proportionately longer and slighter than in any of the species of *Felis*, the animal being obviously cut out for racing much more decidedly than are any of the latter. There are likewise certain distinctive features connected with the skull and the upper flesh-teeth, but on the present occasion these may be passed over without special mention.

In place of being called the “hunting-leopard,” the animal might almost have been better designated the “hunting-serval,” since the black markings on its fur take the form of solid spots like those of the serval, instead of the rosettes distinctive of the leopard. In size and form the animal may be compared to a long-legged and slender-bodied leopard, with short and rounded ears, a tail somewhat exceeding half the length of the head and body, the hair of the neck rather elongated, so as to form an incipient mane (whence the name *jubatus*), that on the under surface of the body rather longer and shaggier than elsewhere, and the fur as a whole of a somewhat coarse type. On the upper-parts of the head and body, as well as the outer surface of the limbs, the ground-colour of the fur varies from tawny to a bright ruddy fawn, while on the under-parts it is paler, and devoid of the small round black spots with which it is elsewhere

¹ See above under the heading of Leopard.

ornamented, the chin and throat, which are buffish white, being also unspotted.

Towards the extremity of the tail the spots tend to coalesce so as to form incomplete rings. The outer surface of the ears is black, except at the base and on the margins, where it is tawny. From the outer angle of each eye a black streak runs to the lip, this being continued, either as a continuous line or a row of spots, from the inner angle of the eye to a point just below the ear. The cubs are very different-looking animals to their parents, having a coat of long and uniformly grey hair, but on turning this back more or less distinct traces of spots are noticeable on the shorter under-fur.

The geographical distribution of the hunting-leopard is very similar to that of the lion. Unknown in Ceylon and on the Malabar coast, the species ranges from the confines of Bengal through Central India and Rajputana to the Punjab, whence it extends through Baluchistan and probably parts of Afghanistan to Persia, Russian Turkestan, Transcaspia, and so on through Syria and Palestine to Africa, where it ranges as far south as the Cape. According to the researches of Dr. Satunin, it is not found in the Caucasus. Further observations are required as to the southern limits of the range of the hunting-leopard in India.

Although much has been written with regard to the training and employment of the hunting-leopard for the purpose of capturing blackbuck and other game animals by the natives of India, comparatively little has been said about the creature in its wild state ; and since this little has been repeated over and over again in works of natural history, a very short notice will be sufficient in this place. The favourite haunts of the Indian hunting-leopard are low, isolated, rocky hills, whence it can obtain an unrestricted view of the surrounding plains, and mature its plans for stalking the blackbuck, gazelles, deer, and other animals which form its prey. These felines hunt in couples, and creep up to within a certain

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distance of their intended victims, when they make one sudden rush at a terrific pace, which, whether successful or otherwise, is the final effort, the pursuit being abandoned if the quarry is not overtaken during the first spurt. Occasionally, instead of a single pair, it is said that a whole family party will join in the stalk and subsequent rush. After a successful foray the hunting-leopard indulges in such a gorge that it generally requires two or three days' repose and quiet before it again takes the field. Before each chase these animals repair to some favourite tree, upon the bark of which they sharpen and clean their claws. The cubs are carefully trained by their parents in the proper method of stalking and taking their prey; and so essential is this parental instruction that, according to native reports, cubs that have not been thus taught are of no use for hunting. Consequently the trained individuals kept by the chiefs for the latter purpose are always captured when full grown. The method of hunting with these tame animals has been so often described, that there would be nothing gained by its repetition.

It may be added that hunting-leopards never attack man, and but very seldom carry off or molest any of his domesticated animals. Considering that on ordinary ground the best English greyhounds have not a chance with blackbuck, the speed of the hunting-leopard during its final rush must be tremendous. This speed can, however, only be maintained for a very short distance, and a well-mounted horseman can always come up with one of these creatures after a comparatively short run, when it generally permits itself to be speared without any very vigorous resistance, although at times requiring to be driven out from the covert in which it has taken refuge. If the statement by Jardine that these animals were formerly kept by the Moghul emperors in thousands for sporting purposes is to be relied on, it would seem that they must have been more numerous than is the case at the present day, when they are comparatively rare.

A full-grown hunting-leopard stands about $2\frac{1}{2}$ feet in height at the

shoulder, and has a total length of about 7 feet, $2\frac{1}{2}$ of which is accounted for by the tail alone.

THE INDIAN CIVET

(*Viverra zibetha*)

NATIVE NAMES.—*Khatas*, HINDUSTANI (in common with several other small Carnivora); *Mach-bhondar*, *Bagdos*, AND *Puda-ganla*, BENGALI; *Bhran* IN THE NEPAL TERA; *Nit-birala*, NEPALESE; *Kung* OF THE BHOTIAS; *Saphiong* OF THE LEPCHAS; *Kyoung-myeong* (horse-cat), BURMESE; *Tangalong*, MALAY

Although commonly called cats or civet-cats, the civets and their allies the palm-civets are really very different animals from the *Felidæ*, forming the separate, although nearly related family of the *Viverridæ*. For one thing, the civets, in place of the short "smug" faces of the cats, have long and sharply pointed muzzles, which implies the possession of a much larger series of teeth in the jaws. And, as a matter of fact, not only are the teeth of all the members of the civet tribe much more numerous than those of the cats, but they are likewise very different in structure, being less completely adapted for the rending of large masses of flesh. Since, however, it is not the object of the present volume to serve as a manual of natural history, such details must be passed over without further mention.

The true civets of the genus *Viverra*, which, with the exception of the fossa (*Cryptoprocta*) of Madagascar, include the largest representatives of the family to which they belong, are distinguished by the grooved upper lip, the long, ringed tail, the absence of tufts on the ears, the black gorget on the throat, the long and loose character of the fur, which is generally elongated into a kind of crest down the back, and the short and partially retractile claws. They walk on the tips of their toes, and, with the

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exception of the "pads," the entire foot is hairy. Above all, these animals are furnished with a pouch in the groin which secretes the strong perfume from which they derive their name (or which derives its name from them).

The present species, sometimes known as the large Indian civet, exceeds in size all the other members of the group inhabiting the country, the length of the head and body being about 32 inches, and that of the tail 8 inches. Perhaps its most distinctive specific feature is to be found in the banding of the whole length of the tail by alternate dark and light rings. The general colour of the fur is a dark hoary grey, frequently with a more or less decided brownish or reddish tinge, the sides of the body being often uniformly coloured, but in other instances marked with transverse cloudy dark bars; the crest, like the gorget on the throat, is black, but the front and sides of the throat, as well as the chest, are pure white. Not unfrequently there is a dusky band above and another below the gorget, and when the second of these is developed, it joins a horizontal streak running from behind the ear. The upper portion of the limbs shows dark barrings externally, but their lower parts are uniformly blackish brown, or black.

The range of this civet in the area under consideration includes Burma, Assam, the Eastern Himalaya, and Bengal; in Sikhim and Nepal the animal ascends to a considerable elevation above the sea-level. In its habits it is for the most part solitary, hiding in thick covert during the day, and wandering in search of food by night. Although it cannot climb, it takes readily to the water, and it frequently makes its lair in some hole in the ground. All animals that it can kill, as well as eggs, seem acceptable as food to the civet, which not unfrequently does considerable harm to domestic poultry. As the skin is of little value, this animal offers but slight attraction to the sportsman.

Three other, but smaller species of civet inhabit India and Burma. In

addition to these there are, in the Eastern Himalaya and Burma, the graceful and beautifully coloured linsangs (*Linsanga*), while various species of palm-civets, or tody-cats (*Paradoxurus*), as well as mongooses (*Herpestes*), are to be met with all over the country. None of these can, however, be regarded as game animals, even in the widest sense of that term, and we may accordingly pass on to another member of that *Viverridæ* which seems to merit a brief notice.

THE BINTURONG

(*Arctictis binturong*)

NATIVE NAMES.—*Yung*, ASSAMESE ; *Myouk-kyä* (monkey-tiger),
BURMESE ; *Untarong*, MALAY

(PLATE IX. FIG. 1)

Whereas prehensile tails, by means of which their owners have the power of slinging themselves to branches, are of common occurrence among the marsupials of Australia, the ant-eaters and monkeys of South America, and the opossums of both divisions of the New World, for some hitherto unexplained reason such a power in the caudal appendage does not appear to be in fashion in other parts of the world. The binturong, or, as it should be correctly called, untarong, is, however, one of the very few exceptions to this rule, and for this, if for no other reason, is worthy the attention of the sportsman. It is, indeed, the only prehensile-tailed mammal of any size to be found throughout the whole extent of the three great continents of the Old World.

The binturong may perhaps be best compared in size and general appearance to a very large, very long-tailed, shaggy black cat, with tufts of elongated hairs to its pointed ears. And as it cannot possibly be confused with any other animal, this comparison will suffice for its

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identification when encountered. It may, however, be as well to add that, instead of walking entirely on its toes, after the manner of a cat, the binturong applies the whole of the under surface of the hind-foot to the ground, like a bear. In most specimens of the animal there is a more or less marked tendency to the development of a grey grizzling, and in Borneo there occurs a distinctly grey phase. The length of the head and body ranges between 28 and 33 inches, and that of the tail between 26 and 27 inches.

The distributional area of the binturong extends from the great Malay Islands and Peninsula through Borneo to Assam. Mr. W. T. Blanford states that its alleged occurrence in the Eastern Himalaya is doubtful, but Mr. W. L. Sclater says that it is found even as far west as Simla. However this may be, there is no doubt that the animal is essentially a Malay type.

The binturong has been from time to time exhibited in the London Zoological Gardens, and as it is a purely nocturnal creature, it is mainly from these captive specimens that the little we know of its mode of life has been gleaned. It is always found in forests, and is probably for the most part, if not completely, arboreal. The aforesaid captive individuals have demonstrated the prehensile power of the tail, and have likewise indicated the omnivorous tastes of the creature. As to its breeding-habits, there is ample opportunity for sportsmen to enlighten naturalists, as there is to ascertain the truth of the assertion that the binturong utters a weird and piercing cry.



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PLATE IX

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|---------------------|---------------------------|
| 1. Binturong. | 7. Short-tailed Panda. |
| 2. Striped Hyæna. | 8. Himalayan Brown Bear. |
| 3. Tibetan Wolf. | 9. Tibetan Blue Bear. |
| 4. Indian Wolf. | 10. Himalayan Black Bear. |
| 5. Wild Dog. | 11. Malay Bear. |
| 6. Himalayan Panda. | 12. Sloth-Bear. |

THE STRIPED HYÆNA

(Hyæna striata)

NATIVE NAMES.—*Lakar-bagha*, *Lakar-bagh*, OR *Lakra*, *ʃhirak*, *Hondar*, *Harvagh*, AND *Taras*, HINDUSTANI, IN DIFFERENT PARTS OF THE COUNTRY; *Taras*, MAHRATHI AND SINDI; *Cherak*, SINDI; *Aptar*, BALUCHI; *Renhra* OF THE GONDS; *Hebar-kula*, HO-KOL; *Derko-tud* IN THE RAJMEHAL HILLS; *Dhopre*, KORKA; *Kirba* AND *Kut-kirba*, CANARESE; *Dumul-gundu* AND *Korna-gundu*, TELEGU; *Kaluthai-korachi*, TAMIL

(PLATE IX. FIG. 2)

Hyænas are among the few animals for whom no one has a good word to say; and it must be confessed that they are attractive neither in personal appearance or in habits. But in spite of this they are decidedly useful and beneficent creatures, being perhaps the most efficient of all scavengers, since their powerful cone-like teeth enable them to crack bones of considerable calibre, and thus to devour skeletons which are left by all other animals. In return for these benefits, the striped hyæna, when captured, as the present writer had once the misfortune to witness, is cruelly maimed and tortured by some, if not by all the natives of India!

Although there may be some confusion between the spotted species of Africa and the hunting-dog of the same country, no one, in India at any rate, is likely to mistake a hyæna for any other animal, or to fail to recognise one of these creatures when met with, either alive or dead. Consequently, there is no need to describe the distinctive features by which these animals are separated from the cats and civets on the one hand and the dogs and wolves on the other. Nor is it necessary to record in prolix details the specific characters of the striped species, seeing that it is the only

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representative of its kind met with in India. As regards the first point, it will accordingly suffice to say that these animals are classed by naturalists in a family by themselves—the *Hyænidæ*—and that this family exhibits certain indications of affinity with the *Felidæ* and *Vrverridæ*, as it does likewise, on the opposite side, with the *Canidæ*. No one who has ever had the opportunity of examining a hyæna's skull will have failed to recognise the enormous biting power indicated by the great vertical ridge or wall of bone running down the middle of the temporal region, or the bone-crushing capacity of the (premolar) teeth immediately behind the tusks, which, instead of the compressed form they exhibit in the cats and dogs, have assumed the shape of blunt truncated cones, admirably adapted for the purpose for which they are by nature intended. So great, indeed, is the power of its jaws, that a hyæna is commonly credited with being able to crack the leg-bone of a horse at a single snap.

Compared with its spotted African cousin, from which it is readily distinguished by the characters of its skull and teeth, as well as by its external appearance, the Indian striped hyæna is a comparatively small beast, standing about 26 inches and measuring about $3\frac{1}{2}$ feet from the tip of the snout to the root of the tail, the tail itself averaging $1\frac{1}{2}$ feet in length. The general colour of the untidy and shaggy fur, which is elongated into a semi-upright crest or mane along the neck and back, is dirty grey, marked with a number of narrow transverse tawny or blackish stripes on the body and limbs.

Not extending into the countries lying east of the Bay of Bengal, unknown in Ceylon, and comparatively rare in Lower Bengal, the striped hyæna ranges over the greater portion of the peninsula of India, and thence extends westward through South-Western Asia to North Africa. It belongs therefore to the western element in the fauna of India, and while fossil remains of more or less nearly related species occur in the Pliocene rocks of Northern India, others indistinguishable from the corresponding

elements of this particular species have been recorded from those of England and other parts of Europe.

As a rule, the Indian hyæna prefers open country, especially of a hilly nature, for its resort, and is seldom seen in forest, although it may take cover in grass or bushes, or even sugar-cane. Rocky ravines are perhaps the places most generally chosen by these skulking and cowardly animals for retirement during the day, and here they make their lairs among the crevices and clefts in the rocks, or in holes dug in the soil by their own exertions. Except on the comparatively rare occasions when one is driven from covert during a beat, or a belated individual is encountered returning to its lair in the early dawn, hyænas are but rarely seen by the sportsman, who seldom takes much trouble in looking after them, as they yield little worth his notice in the way of trophies. The skin is indeed quite valueless, and there are not many men who set much store on the skulls of these animals. Sometimes hyænas are ridden down and speared by mounted men, and the sport they then afford is by no means to be despised. It is not that they have any great turn of speed; on the contrary, they are soon outstripped even by a very ordinary horse, but from their frequent doubling and turning they are difficult animals with which to get to close quarters, so that the run is generally of considerable length from start to finish. It is, however, but few men who have ever practised hyæna-spearing; and to the majority of sportsmen these animals prove a downright nuisance, from their propensity to gnaw and otherwise damage skulls, skins, or other edible articles (including leather boots) left unguarded and within their reach at night. Sometimes one of these animals summons up courage to enter the door of a tent left open on a hot night, when the occupant may be startled by the glare of its green eyes as it stands in the doorway.

Generally the striped hyæna is a solitary creature, prowling about alone at night in search of the carcasses of animals killed by *Carnivora* bolder

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than itself, or of those which have succumbed to disease. And it is reported that one of these animals will have no compunction in devouring the body of another member of its own species, if it should perchance encounter one. A large proportion of their food is formed by the skeletons of animals whose flesh has been partially devoured by the larger Carnivora, and the bones subsequently picked nearly clean by vultures and jackals. The gnawed ends of such bones are not unfrequently left by the hyænas at the entrances of their dens, the situation of which is thus revealed to the observant passer-by. Although they seldom, if ever, appear to kill healthy wild animals, they not unfrequently take toll of the smaller domesticated kinds, such as sheep, goats, and dogs, Bruce relating that in Abyssinia he lost several valuable greyhounds by the jaws of these skulking nocturnal marauders. The sound of the shrill and weird cry of this species when once heard at night will not readily be forgotten, although it is almost impossible to describe it in words.

THE COMMON WOLF

(*Canis lupus*)

NATIVE NAMES.—*Gurg*, PERSIAN; *Gurk*, BALUCHI; *Kharma*, BRAHUI;
Ratnahan, KASHMIRI

The typical, or common wolf of Europe, of which the Tibetan wolf is one local race, and the wolf of North America apparently a second, is such a well-known animal that no detailed description is necessary. It is one of the largest wild representatives of the dog tribe, or *Canidæ*, standing about 2 feet 4 inches in height, and measuring from 3 feet 6 to 9 inches from the muzzle to the root of the tail, the length of the tail itself varying from 15 to 16, or if the hair at the tip be included, some three inches

more. The general colour of the long and thick fur of the upper-parts of the head and body and outer surfaces of the limbs is some shade of yellowish or reddish grey, frequently more or less mingled with black, wholly black individuals being by no means uncommon, and the tail being not unfrequently black-tipped. The under-parts and the inner surfaces of the limbs are whitish. A soft woolly under-fur, of which the general colour is slaty or light brown, is developed at the bases of the longer hairs.

Within the area treated of in the present volume the ordinary or typical race of the wolf is probably met with in the northern part of the Punjab, and certainly in the west of Sind and in Baluchistan, whence it ranges into Persia and doubtless also into Afghanistan. Probably also this race extends into the valley of Kashmir, but it is replaced on the Ladak side of the range forming the northern barrier of that valley by the Tibetan race. Information is required as to the wolf of the Gilgit neighbourhood, but it probably will be found that somewhere in this district there exists a complete transition between the typical and the Tibetan races of the species.

It will be unnecessary to refer to the habits of the common wolf on the present occasion.

THE TIBETAN WOLF

(*Canis lupus laniger*)

NATIVE NAME.—*Chanko*, TIBETAN

(PLATE IX. FIG. 3)

In order to withstand the intense winter cold of the bleak altitudes at which it dwells, and at the same time to harmonise with its physical surroundings, the wolf of Ladak and Tibet has developed a woolly char-

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acter in its fur, and at the same time has become a much paler animal than ordinary examples of the European race. So pale, indeed, is the colour of the fur that, as is well shown by a mounted specimen shot by Mr. Powell-Cotton in Ladak and exhibited in the British Museum, it may be best described as whitish grey. As in the case of the ordinary wolf, individuals are, however, occasionally seen in which the entire coat is black, more or less grizzled with grey in the region of the snout, one of these "sports" being likewise exhibited in the national collection.

According to Ladaki reports, black individuals of the Tibetan wolf, which are known to the natives as *Chanko nagpo*, and appear to be by no means uncommon, are bolder and more aggressive animals than the ordinary pale-coloured examples; and seeing that a similar idea is current with regard to black leopards, it would be interesting to find out whether this belief is founded on fact. These wolves are but seldom encountered by European sportsmen, General Kinloch and Mr. Darrah being among the few who have seen them. According to the account given by the former writer, it appears that chanko are usually found either singly or in pairs, and that, in summer at any rate, they never collect in packs after the manner of the common wolf in Siberia. They are in the habit of prowling round the flanks of the flocks of the natives, watching their opportunity to attack and carry off sheep when the guardian mastiffs are occupied elsewhere, General Kinloch being of opinion that they prefer the capture of domesticated animals to the chase of wild ones. Mr. Darrah, however, records that the body of a shapu shot by himself was very soon devoured by these animals. General Kinloch was successful in obtaining and taming a pair of cubs, which were brought to England in 1868.

THE INDIAN WOLF

(Canis pallipes)

NATIVE NAMES.—*Bheriya*, GURG, HONDAR; *Nekra* AND *Bighana*, HINDUSTANI; *Bagyar*, SINDI; *Landga*, GONDI AND DECCANI; *Tola*, CANARESE; *Toralu*, TELEGU

(PLATE IX. FIG. 4)

According to a paper on the *Canidae* of Africa by Mr. W. E. de Winton, published in the *Proceedings of the Zoological Society of London* for the year 1899, a large amount of misconception has occurred with respect to the true Indian wolf of the Deccan on account of its having been confused by certain writers with the European wolf of the Punjab and Sind. For instance, it is stated by the gentleman above named that the animal figured in a coloured plate by Dr. Mivart in his *Monograph of the Canidae* as the Indian wolf, is in reality the European wolf of North-Western India. Consequently, the former animal has been supposed to be much more nearly related to the European wolf than is really the case. According to Mr. de Winton, the Indian wolf, like the American coyote, is to a considerable degree intermediate between the true wolves and the jackals, and thus serves to show the intimate connection between those two sections of the genus *Canis*. In point of size it is a larger animal than the Indian jackal (*Canis aureus*), but is in this respect very similar to the larger of the two forms of the Egyptian jackal (*C. anthus*). Between the skulls of the latter and that of the Indian wolf there is in fact no practical difference in point of size, although the Indian animal is distinguishable at a glance by its larger and heavier teeth, the difference being especially noticeable in the case of the upper carnassial, or flesh-tooth.

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In addition to being smaller than the European species, the Indian wolf is also a slighter built animal, with little or none of the woolly under-fur which is so well developed in the former. In length the head and body are about 3 feet, against $3\frac{1}{2}$ feet in the European species. According to the description given by Mr. W. T. Blanford, which accords well with the skin from which the figure of the head in Plate IX. Fig. 4 of the present volume is taken, the general colour of the fur is greyish fulvous, usually showing a more or less distinct tinge of brown, and in some instances mingled with black on the back. Although it has been stated that rufous-coloured skins have been met with, all the specimens in the British Museum are browner than those of the European wolf, and of an earthy grey colour, and it is not improbable that the rufous-coloured skins assigned to the present species are really referable to the latter animal. On the back the tips of all the hairs are black, and near the skin coarser white hairs are everywhere mingled with the ordinary fine brown fur. As a rule, the hairs on the tail are black-tipped, and the fur of the under surface of the body is of a dirty white colour. The cubs are sooty brown in colour, with a conspicuous spot of pure white in the centre of the chest, which, however, disappears in the course of a few weeks, when a dark gorget, which likewise vanishes before the attainment of maturity, is developed.

The typical locality for the Indian wolf is the plateau of the Deccan, from which locality it was first described by Colonel Sykes in 1831. From the Deccan it ranges over a considerable portion of the Indian Peninsula, although not extending into the foot-ranges of the Himalaya nor to the Trans-Indus districts of the Punjab and Sind. Indeed it is doubtful if it reaches the Indus in the Punjab, since a skull from the Salt Range has been regarded as referable to the European wolf. The Indian species appears to be unknown on the Malabar coast, and is far from common in Bengal. In Ceylon it is quite unknown, as it is in the countries to the

east of the Bay of Bengal, so that it is one of the comparatively few animals absolutely restricted to Peninsular India. Open plain country forms its usual resort, and it is but rarely met with in hills or forest.

Except that it never collects in large packs after the manner of its European cousin in many parts of Russia and Siberia, the Indian wolf appears to be very similar in its general mode of life to the former, so that there is nothing in this respect calling for special notice. Although preying largely on the smaller domesticated animals, the Indian wolf appears to be a terrible foe to the blackbuck, while even man himself is by no means exempt from its attacks. In attacking adult human beings it appears that two or more individuals are in the habit of joining forces ; but in carrying off children from villages—to which the great bulk of the mortality from these animals is due—a single wolf is of course able to do the whole business by himself.

When caught in the early morning in a more or less gorged condition, the Indian wolf may sometimes be ridden down and speared by a well-mounted man, but at other times, although not appearing to be going at any great pace, will always keep easily ahead of the fleetest greyhounds till the latter succumb from sheer exhaustion. When their “earths” are known, they may sometimes be smoked out and shot ; but, taken altogether, these animals afford little sport, and should be regarded rather in the light of “vermin” than of “big game.”

Since the last remark applies with even greater force in the case of the Indian jackal, it has not been deemed advisable to include that species in the list of species described in the present volume, and it is accordingly dismissed without further notice.

THE MALAY WILD DOG

*(Canis sumatrensis)*NATIVE NAMES.—*Tau-khwe*, BURMESE ; *Anjing-utan*, MALAY

The wild dogs of Asia, which, by the way, have no near affinity with the African hunting-dog, are broadly distinguished from domesticated dogs, wolves, jackals, and foxes by the loss of the last pair of teeth in the lower jaw, so that the total number of their teeth is only forty, instead of forty-two. Additional points of distinction are to be found in the relatively shorter muzzle, in the profile of the face being slightly convex, instead of straight or concave, and also in the greater number of teats possessed by the female, these forming either six or seven pairs in place of the usual five. The presence of long hairs between the naked pads on the soles of the feet is another character in which the wild dogs differ from the more typical wild representatives of the *Canide*.

As to whether these points of distinction are sufficient to justify the separation of the wild dogs as a genus (*Cyon*) apart from the wolves and jackals, there is some difference of opinion among naturalists. As a compromise, they may be regarded as a subgenus, so that the full title of the present species will be *Canis (Cyon) sumatrensis*. And here it may be mentioned that the Malay wild dog was described in 1822 as a variety of domestic dog, under the name of *Canis familiaris*, var. *sumatrensis* ; and since this name is earlier than any other¹ applied to either the Indian or the Malay animal, it must stand, according to modern rules of nomenclature, for the species.

In regard to the name "wild dog," commonly applied to these animals, Mr. Blanford remarks that it is clearly a misnomer, "for in every

¹ A still earlier name is *Canis javanicus*, but it is uncertain to what animal it was applied.

important detail in which the genus *Cyon* differs from *Canis*—in the form of the skull, the dentition, and the number of mammae—domestic dogs agree with the latter and not with the former.” And he goes on to state that the name has probably been applied to the members of the present group on account of their hunting in packs, their handsome appearance, and their courage. The name is, however, an exact translation of the Malay *anjing-utan* and the Hindustani *jangli kutta* ; and this we venture to think is its more probable origin. And in any case a change in the common usage is not advisable. It is true that the title “dhole” has been employed by the late Colonel Hamilton Smith and some other writers, but since this is by no means a euphonious term, and, moreover, is not the name by which these animals are known in any one of the countries they inhabit, its use is to be deprecated.

The geographical distribution of the species of wild dogs is, as Mr. Blanford remarks, decidedly peculiar and abnormal. They are confined to Asia, where their range includes Central Asia as far north as the Altai, Amurland, and the island of Sagalien, while to the southward it embraces India, Burma, and the Malay Peninsula and Islands, with the exception of Celebes and the Philippines. Curiously enough, however, no representative of the group has hitherto been found either in the north of China or in Japan.

The Malay wild dog appears to be distinguished from the Himalayan and Indian representative of the group by its somewhat smaller size and slighter build, the limbs being decidedly more slender. The fur also seems to be of a brighter tinge of red, and the tail, of which the tip is black, is stated to form a smaller brush. From Himalayan specimens of the Indian wild dog, the present animal also differs by the absence of a woolly under-fur at the base of the longer hairs of the coat, but as the same absence characterises Indian skins of the former, this feature cannot be reckoned a point of distinction.

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The Malay wild dog is known to occur in Sumatra, Java, the Malay Peninsula, and Tenasserim, and it has been reported from Borneo. It has, however, yet to be determined whether the wild dog of Northern Burma is identical with the present or the next form, and it may be regarded as certain that when a full series of specimens is obtained, a complete transition will be found in the districts between Tenasserim and Assam from the one to the other.

Since the habits of the Malay wild dog are doubtless identical with those of its Indian relative, one account will serve for both.

THE INDIAN WILD DOG

(*Canis sumatrensis deccanensis*)

NATIVE NAMES.—*Jangli-kutta*, *Ram-kutta*, *Son-kutta*, AND *Ban-kutta* IN HINDUSTANI; *Kolsun*, *Kolasna*, *Kolasra*, AND *Kolsa* OF THE MAHARATHAS; *Reza-kutta* AND *Adavi-kutta* IN TELEGU; *Shin-nai* OF THE MALABARESE; *Eram-naiko* OF THE GONDS; *Tani* OF THE HO-KOL; *Vatai-karau* IN TAMIL; *Ram-hun* IN KASHMIRI; *Siddaki* IN LADAK; *Bhaosa*, *Bhansa*, AND *Buansu* IN THE HIMALAYA; *Hazi* AND *Phara* IN TIBET; *Paoho* OF THE BHOTIAS OF DARJILING; *Sa-tum* OF THE LEPCHAS

(PLATE IX. FIG. 5)

Whether the wild dog of India and the Himalaya is or is not specifically the same as the Malay wild dog is a point on which scarcely any two naturalists are agreed. A compromise between the two opposite opinions may be obtained by regarding the two as local races of a single species, when the full name of the Malay form will be *C. sumatrensis typicus*, and the Indian *C. sumatrensis deccanensis*. Both differ from the wild dog of the Altai and other parts of Central Asia (*C. alpinus*) by the circumstance

that the upper cutting, or "carnassial" tooth is longer than the combined length of the two molars behind it, instead of shorter. From the analogy of the distribution of other animals, it might have been supposed that the wild dog of the Himalaya and Tibet would be nearer to the Altai than to the Indian form ; but this is not found to be the case, and the Tibetan and Indian animals, which agree in the relative size of their teeth, are regarded as identical. The typical Deccan wild dog has, however, no under-fur, and as this occurs in Himalayan and Tibet specimens, some naturalists might be disposed to regard them as distinct races ; but as they appear to be otherwise similar, such a distinction is perhaps unnecessary.

In general appearance and build the Indian wild dog (like its Malay relative) is decidedly more like a jackal than a wolf, the limbs being proportionately shorter than in the latter. The tail forms a good brush. In length the head and body of a full-grown male measure between 37 and 38 inches, while the tail, inclusive of the hair, measures between 14 and 15 inches. Mr. Blanford describes the colour as follows :—"On upper-parts generally rusty red, varying in some specimens to rufous grey, or even light brownish grey, paler below. The colour is generally not uniform, being variegated by dark tips to the dorsal hair. The under-fur, when present, varies in colour from light brown to dull rufous on the upper-parts, and has light-coloured, coarser hairs intermixed ; the longer hairs are light rufous, with dark rusty-red tips. Terminal portion of tail black (very rarely the extreme end is whitish). The young animals are sooty brown throughout."

From the Malay, or typical race of the species, the Indian wild dog appears to be distinguished by its somewhat superior size and more powerful build, as well as by the less bright ferruginous tint of the fur. As already said, the presence of under-fur cannot be regarded as a distinction between the two races, since it is wanting in the typical Deccan form of the present race.

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The Indian wild dog has a comparatively wide geographical range, extending from Eastern Tibet to Cape Comorin, although apparently unknown in Ceylon. It has been recorded from Gilgit, Ladak, Spiti, Nepal, Kashmir, and the Western Himalaya generally. Its apparent absence from Ceylon suggests that it did not reach the mainland of India till after the separation of the former island; and as remains of other species of wild dog are found in some of the European caverns, it would seem highly probable that the group was originally a western one, and that it has gradually travelled farther and farther to the east.

Like the other members of the group, the Indian wild dog is a ferocious and gregarious animal, hunting its prey in packs, which usually comprise from six to a dozen individuals, although occasionally as many as a score. Whereas, however, in the plains of India and the outer ranges of the Himalaya it dwells in forests, in Tibet it must necessarily be an inhabitant of much more open country. The devastation it inflicts on deer, wild sheep, and the chiru antelope of Tibet must be very great; and General Kinloch observes that in Ladak, wherever its footprints are to be met with, the sportsman may as well at once give up all hopes of killing game. Even the tiger and the Himalayan black bear are stated on good authority to occasionally fall victims to the determined attack of these bloodthirsty marauders, the mangled remains of a tiger having in one instance been found lying side by side with the bodies of three wild dogs. In the Himalaya ibex form a very large proportion of the prey of these animals; and it has been stated that the serow is the only creature capable of withstanding their attacks, sometimes even transfixing its assailants with its sharp and powerful, although short horns, which are admirably adapted for stabbing. Possibly, too, the dense and long coat of the serow may stand it in good stead when repelling attacks of this nature. Instances are on record where wild dogs have succeeded in pulling down not only such a large animal as the sambar deer, but even the domestic Indian buffalo.

Although freshly-killed flesh is the general diet of these animals, it is probable that, as in the case of most other Carnivora, a meal of carrion forms an occasional variety to the *menu*. Since they generally avoid the neighbourhood of human habitations, the toll levied by wild dogs on domesticated animals is much less than in the case of many others of the Carnivora ; but they at times kill sheep, goats, and cattle, while, as already mentioned, they occasionally venture to attack the buffalo. The late Mr. Wilson, whose observations have been confirmed by others, has remarked that great sagacity is displayed by the wild dogs during the breeding-season in driving their prey to the neighbourhood of their dwelling-places before giving it the *coup-de-grace*, so that there should be the least possible trouble in carrying the supply of food to the spot where it is required.

The same gentleman has likewise recorded that in some instances at least wild dogs breed in a kind of warren, where several females associate together, one such breeding-place having been discovered near Simla. Winter is the breeding-season, the young being usually produced in holes or clefts among rocks during the months of January, February, and March. From two to four appears to be the usual number of pups produced in a litter, but on rare occasions there may be as many as half-a-dozen.

Although wild dogs generally hunt their prey in the daytime, it is probable that sometimes at least they are also on the move during the night. It has been asserted that, when in pursuit, they "give tongue," like hounds, but this is denied by an observer who saw a pack in full chase. Others state that these animals howl at night.

In captivity wild dogs from all districts appear to be very difficult to tame, if indeed they are not absolutely untamable. It is true that when taken as puppies they display a certain amount of docility during the earlier months of their captivity, and will even play with domestic dogs, but with advancing age their wild nature reasserts itself with its original force, and they become spiteful and dangerous to all comers.

THE HIMALAYAN PANDA

(Ælurus fulgens)

NATIVE NAMES.—*Wah*, *Ye*, AND *Nigahya-ponya*, NEPALESE ; *Thokya* AND *Thongwa* OF THE LEPCHAS ; *Wakdonka* AND *Woker* OF THE BHOTIAS ; *Sankam* OR PERHAPS *Saknam* OF THE LEPCHAS

(PLATE IX. FIG. 6)

There are several names commonly used in popular natural history, of which the origin is totally unknown, among these being "Panda," which is the title by which the present animal was called when exhibited alive in the London Zoological Gardens. It is certainly not current among any of the native tribes in the districts where the animal dwells, by some of whom it is called *Wah*, or *Thongwa* ; and were it not that panda has come into very general use, one of these would be a decidedly better title. But, after all, the origin of a name, so long as it be concise and euphonious, is not of much consequence, and as panda fulfils both these conditions, it may continue to be employed. The alternative names red cat-bear and Himalayan raccoon, which have been proposed, are both open to objection.

The panda is one of the most beautifully coloured of all mammals, and in size and shape somewhat recalls a cat, although it may be distinguished at a glance from that animal by the circumstance that in walking it applies the whole of the soles of the feet to the ground. Cat-like features are displayed by the rounded form of the head, the short and broad face, in which the eyes are directed forwards, and the small rounded ears. The limbs are short and stout, with the feet and their pads completely covered with fur, and the large claws sharp and capable of partial

retraction within protecting sheaths. The long, thick, and soft coat has a woolly under-fur, and the well-haired cylindrical tail, which is rather more than two-thirds the length of the head and body, is marked by rings of a paler hue than the general colour of the fur, its tip being black. The prevailing colour is a rich rusty red, frequently somewhat paler on the back than elsewhere, and always lighter on the forehead; the under-parts of the body and the inner surface of the limbs are for the most part black, although brownish in places, and the outer side of the ears is likewise often sable, although sometimes dark red. With the exception of a red stripe running down from the eye to the angle of the mouth, and sometimes also of a line from the forehead to the snout, the face and lips are pure white, as are also the margins and inner surface of the ears. The claws, too, are white, and the soles of the feet whitish or whitey brown. The length of the head and body of the panda varies from 20 to 24, and that of the tail (exclusive of the hair at the tip) from 16 to 17 inches, the weight of the animal ranging between 7 and 9½ pounds. Individuals are occasionally met with in which the black tends to invade the upper-parts.

Very curious are the teeth of the panda, which at first sight recall those of the hoofed herbivorous mammals, the tusks being small and weak, and the molars with a complicated arrangement of cusps on their grinding surfaces. A closer examination of these latter teeth shows, however, that they are essentially similar in general structure to those of the American raccoons, and thus unlike those of all the other Carnivora.

The panda has a somewhat remarkable geographical distribution, inhabiting the Eastern Himalaya, at an elevation between about 7000 and 12,000 feet, as far westwards as Nepal, and extending eastwards through the mountainous districts of Assam into Yunnan, but being quite unknown in the Malay countries.

For a long time the panda was regarded as representing a family group by itself, although its resemblance to the American raccoons had been

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pointed out by Brian Hodgson and Edward Blyth, the latter of whom, indeed, classed it among the raccoons. In 1869, when the first living specimen brought to England was presented to the Zoological Gardens by Dr. Simpson, the late Mr. A. D. Bartlett pointed out how closely this animal resembled the American kinkajou (one of the raccoon family) in its habits, while at the same time the late Sir W. H. Flower demonstrated its anatomical relationships with the raccoons. In the *Mammals of India*, Mr. W. T. Blanford definitely classed the panda in the raccoon family (*Procyonidae*), while at a later date Professor E. Ray Lankester came to the conclusion that the remarkable *Æluropus* (which stands next in our list) was also a near ally of the panda, and not, as previously supposed by most naturalists, an aberrant bear. Instead, therefore, of the raccoons being confined to the New World, they are represented by two peculiar outlying forms in the Himalaya and Tibet. Finally, it may be mentioned that remains of a large species of panda have been discovered in rocks of comparatively modern age in England, and likewise in Hungary.

Like all the animals of the Eastern Himalaya, the panda is a forest-dwelling creature, making its lair either in a hollow tree, or, as some have suggested, in the crevices of rocks. It is, however, by no means purely arboreal, as it frequently descends to the ground for the purpose of feeding. Neither is it by any means exclusively nocturnal in its movements, although it certainly passes a considerable portion of the day in slumber, its chief feeding-times being the morning and the evening. Generally a pair, sometimes with their offspring, are found in company, and, as might be assumed from the structure of the teeth, its diet is mainly of a vegetable nature, although it certainly eats eggs, and not improbably also insects and grubs. Since it is remarkably dull of hearing and sight, and apparently not endowed with an acute sense of smell, while its means of defence are but feeble, the panda is a creature by no means difficult to capture, and examples are not unfrequently taken by the Lepchas in the neighbourhood

of Darjiling. In spite of this, it is but very seldom brought to England ; and up to 1896 only two examples had been exhibited in the London Zoological Gardens, namely the one already mentioned as having been presented by Dr. Simpson in 1869, and a second purchased in 1876. Years ago the present writer had, however, the opportunity of seeing specimens then living in the Zoological Gardens at Calcutta, and lovely little animals they were.

Ordinarily the panda utters a faint kind of squeak, which has been compared to the chirp of a bird ; but during the pairing-season it indulges in loud, unearthly cries, and when angered it will hiss and spit like a cat. The young, of which there are generally two at a time, are born in the spring.

THE SHORT-TAILED PANDA

(*Æluropus melanoleucus*)

(PLATE IX. FIG. 7)

The rare black-and-white bear-like animal from Tibet bearing the above name was long supposed to be a member of the family *Ursidae*, since in its general form, and especially in the extreme shortness of the tail, it has a marked resemblance to a small bear, although with a much shorter and more rounded head. But (with the singular exception of the Tibetan species) all the members of the bear family—whether black, brown, grey or white—are specially characterised by their uniformity of coloration ; and this fact alone might have been sufficient to raise doubts as to whether a single species in which jetty black and creamy white are contrasted with one another in the most striking and bizarre manner could rightly be included in the same family. When first described some idea

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of the relationship of this animal to the Himalayan panda (*Ælurus*) was entertained ; and it was for this reason that it was named *Æluropus*. This supposed relationship was, however, ignored by English naturalists till quite recently, when Professor E. Ray Lankester, from a careful study of the skull, teeth, and skeleton, came to the conclusion that the present animal is really a near relative of the Himalayan panda and has only a very remote kinship with the bears.

Our first knowledge of the great, or short-tailed panda was derived from the travels of the well-known missionary Père David in Eastern Tibet, and the specimens brought home by that intrepid explorer from the district of Moupin, and now exhibited in the Paris Museum of Natural History, were for a long time the only known examples of this strange animal in Europe. In 1896 two fine skins, with considerable portions of the skeletons, were, however, procured by Mr. Walter Rothschild, one of which is in his own museum at Tring Park, while the second is exhibited in the Natural History Museum. Three years later other examples were brought to England by Mr. F. W. Styan, who obtained them in Szechuen, North-West China.

Apart from its remarkable coloration, and the much greater width and shortness of its head, the short-tailed panda is, as already said, very like a small bear. It is true that it has a distinct tail, instead of a mere vestige of that appendage, but this alone would not justify its separation from the bear family. Neither would the fact that the soles of the feet are well clothed with fur, instead of being naked, necessarily involve such separation, seeing that there is a thin coating of hair on those of the polar bear. The skull and teeth, as well as the bones of the skeleton, are, however, so essentially unlike those of a bear, and approximate so closely to those of the Himalayan panda, that there can no longer be any question of the close relationship existing between these two very peculiar animals. And as the Himalayan panda is now regarded as an outlying member of the American

family of raccoons (*Procyonidae*), there seems good reason for including its larger relative in the same group.

As most people are aware, the head and skull of a bear are of a very long and narrow type, with a nearly straight or but little arched profile ; and the upper cheek-teeth likewise conform to this type, being considerably longer than broad. In the short-tailed panda, on the other hand, the head and skull are comparatively short and very wide posteriorly, with a remarkable convex and sloping profile, while the upper cheek-teeth have very broad and nearly square crowns, with a curiously complicated arrangement of cusps and ridges on their grinding surfaces. In all these respects the present animal approximates to the Himalayan panda, from which it differs by having forty instead of only thirty-eight teeth. Nor is this all, for whereas both species have six pairs of lower cheek-teeth, in the Himalayan panda four of these are premolars and two molars, but in the short-tailed panda there are three pairs of premolars and three molars. In possessing three lower molars the latter species differs from all other members of the raccoon family and resembles the bears ; but this retention of an extra pair of teeth can only be regarded as indicating closer affinity with the common ancestor of both raccoons and bears than is possessed by other members of the *Procyonidae*.

Although possessing bear-like feet, the short-tailed panda is perhaps less completely plantigrade than are the bears themselves. In size it may be compared to a small Kashmir bear. The fur is long and thick, and the general colour is creamy white, with the ears, rings round the eyes, the shoulders, and the limbs jetty black.

The width of the skull implies great power in the jaws, and the structure of its cheek-teeth indicates that the creature feeds on a vegetable rather than an animal diet. This inference is confirmed by the meagre reports we possess of the animal's habits. It is stated to be a strict vegetarian, subsisting chiefly on roots and the young shoots of bamboos. It is thus evidently an inhabitant of forest districts, and not of the open

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plateau of Eastern Tibet. In winter its peculiar type of coloration would not improbably render it inconspicuous when walking in snow among tree-stems; but in summer it would apparently be just as conspicuous. Possibly it may be strictly nocturnal, in which case its coloration would be admirably adapted for its concealment in a district where light-coloured rocks occurred among forest.

THE HIMALAYAN BROWN BEAR

(*Ursus arctus isabellinus*)

NATIVE NAMES.—*Barf-ka-rinch* AND *Lal-bhalu*, HINDUSTANI; *Kunia-haput*, KASHMIRI; *Drengmo*, BALTI; *Drin-mor*, LADAKI; *Brabu*, KISHTAWARI; *Dab*, NEPALESE; *Tom-khaina*, TIBETAN

(PLATE IX. FIG. 8)

Everybody thinks they know a bear when they see one, but since even naturalists for a long time regarded the short-tailed panda as a member of the family *Ursidæ*, it may be as well to state how the bears can be distinguished from the last-named animal, to which they have such a strong superficial resemblance. It will be unnecessary to say anything with regard to their external appearance, with which we are all thoroughly familiar; but it may be mentioned that bears are in general uniformly-coloured animals, although often showing a white collar or gorget on the throat. From the short-tailed panda all the existing members of the group may be at once distinguished by the form of the molar teeth, which are long and narrow, the last one in the upper jaw being elongated, and considerably exceeding in length the one immediately in front.

The snow, or red bear, as, by literal translation of its two Hindustani names, the present animal is called by British sportsmen, can scarcely be

regarded as more than a local race of the brown bear of Europe, distinguished by its generally paler fur (especially in young individuals) and its somewhat inferior size. Usually the colour of the long winter coat is a very pale creamy brown, or isabelline fawn, in fairly young individuals, and these sometimes show a white gorget, which is also said to be visible in older individuals immediately after the assumption of the shorter summer fur. Very old animals, and more especially males, become, however, very much darker, and sometimes have a silvery tinge, owing to the tips of the hairs becoming white. The skull of the kunia-haput, as this bear is called in Kashmiri, is characterised by the great elevation of the forehead, so that in a profile view an obtuse angle is formed immediately in front of the eyes. Another feature is the distinct hollow in the skull at the junction of the nasal with the frontal bones. As a rule, the claws are very pale-coloured, or even white.

The majority of brown bears met with in Kashmir do not measure more than a little short of 6 feet in length, and may be less than 5 ; but both General Kinloch and General Macintyre speak of old animals measuring about 7 feet to the root of the tail, and Leith-Adams has stated that, as a very exceptional instance, he saw one which measured $7\frac{1}{2}$ feet. The present writer has occasionally seen specimens which could scarcely have fallen much, if at all, short of 7 feet, but such were rare exceptions.

In the Himalaya the brown bear ranges from Afghanistan at least as far east as Nepal, but is unknown in the outer portions of the range, as it is in the arid districts to the north of the forest region of Kashmir and the adjacent districts. It extends, for instance, into the Tilel valley, and so on to Astor and Gilgit, but is quite unknown in Dras, Suru, Zanskar, and Ladak, as it apparently is in Upper Baltistan. In Kashmir it is, I believe, not found in the Pir Panjal range, or on the southern flank of the Kajnag. Westward of Afghanistan this race in all probability passes insensibly into the closely allied Syrian brown bear (*Ursus arctus syriacus*), which is

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found in the mountains of Persia, as well as in the country from which it takes its name.

For the most part the brown bear in Kashmir and the adjacent valleys lives at a considerable elevation, frequently hibernating in the zone of the birch-forests, which grow at a higher elevation than the pines; and in summer its feeding-grounds are generally on the open grassy hills above the forests, where it may often be seen quietly grazing (for these bears do graze) quite close to the flocks of sheep and goats. It will, however, in autumn often descend to the higher villages for the sake of feeding on grain and walnuts, and will sometimes come even as low as the valley of Kashmir itself, especially in the Lolab district, which forms the north-western extremity of the valley, General Macintyre mentioning that he once shot a very old individual in the Kashmir valley while making a meal off the putrid carcase of a cow. Another season when these bears come low down into the valleys is in the spring, when the mulberries, of which they are remarkably fond, are ripe. Whether at the level of Kashmir itself these bears remain active all the year round it is difficult to ascertain, but in the higher valleys in the neighbourhood, at any rate, such as Tilel and Wardwan, they hibernate for a long season, not venturing forth till the snows begin to melt in March, April, or May. When they first come forth from their winter lairs, which may be either a cleft in the rock or a hollow tree-trunk, their coats are in splendid condition; but in the late summer and autumn, when the animals have become very fat, the fur is in a most dilapidated condition, and the skin not worth the trouble of stripping from the carcase. The supply of fat accumulated during the summer and autumn is, of course, completely consumed during the winter slumber and fast, the animal coming forth in the spring as thin as the proverbial herring. To the female the winter fast must be an especially trying time, as it is during the hibernation that the cubs, generally two in number, are born. In the higher valleys the mother-bear is

generally to be seen in spring accompanied by her two cubs, the father of the family generally wandering about by himself at some distance off. When they first venture abroad among the birch-forests the ground is still to a great extent covered with snow, and it is probable that their food must consist largely of bark, twigs, and moss ; but as soon as the grass grows they take at once to grazing.

Very little that is edible seems to come amiss to a Kashmir brown bear ; the partiality of these animals for grass, grain, fruit, and an occasional meal of carrion has been already mentioned ; but they are also fond of grubbing for ants and the bulbs of the numerous lily-like plants which grow in the valleys around Kashmir above the limit of forests. They are reported to occasionally kill sheep and goats, and an instance is on record of an old bear killing a couple of his younger brethren and partially devouring their bodies.

As a rule, they are by no means vicious or quarrelsome creatures, although occasionally a coolie, generally through his own foolhardiness, is mauled by one, while sometimes a European sportsman gets to closer quarters than is altogether pleasant. This, however, is generally owing to the reprehensible practice of shooting *uphill* at a bear, the rule being to get above the animal on the hill-side, and shoot downwards, when, after being hit, it will roll away from the sportsman. When two bears are feeding peaceably side by side, and one is wounded by a bullet, it will generally, with a loud grunt of rage, turn furiously on its companion, whom it evidently considers the aggressor, and the pair can then in most cases be bagged by the sportsman.

Five-and-twenty years ago bears were extraordinarily numerous in Tilel, and the writer is almost afraid to say how many he has seen in a day. Now, however, their numbers have been woefully diminished. To the beginner bear-shooting is exciting enough, but it soon begins to pall, since with proper precautions to prevent them from winding the sportsman,

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these animals can be approached to within a very short distance, and killed outright at the first shot. On one occasion, near the upper end of the Tilel valley, the present writer succeeded in getting within about 20 yards of a brown bear, and killing it stone dead with a smooth-bore bullet, which broke one of the vertebrae of the neck. When after ibex, shikaris are much put out if their masters turn aside for the sake of a bear. In stalking, Kashmiri shikaris invariably ascertain the direction of the wind, which in the higher valleys is liable to shift at any moment, by dropping fragments of grass.

General Macintyre gives the following account of the behaviour of a pair of cubs whose mother he shot. "As I considered," he writes, "the youngsters quite big enough to take care of themselves, I aimed deliberately at the old lady and let drive; she rolled a short distance down the hill, and, after a few struggles and groans, expired. The two cubs at first merely stood up on their hind-legs and gazed about them with much apparent astonishment. But on seeing their mother lying motionless below, they at once ran down to her, when their behaviour was such that I felt quite sorry I had shot her. The anxiety they plainly evinced, as they ran grunting and sniffing about their defunct parent, was quite touching to behold. Even on observing us as we approached they seemed very unwilling to leave her. When they at last made up their mind to do so, they merely retired into an adjacent patch of wood, where they continued their whining lamentations, occasionally venturing out a few yards to stand upright and watch us as we ruthlessly stripped their dam of her hairy coat, and did not take their final departure until we gave chase, thinking we might capture them. Although they were too small to shoot, they were quite knowing enough not to allow themselves to be caught."

THE TIBETAN BLUE BEAR

(Ursus pruinosus)

(PLATE IX. FIG. 9)

For many years naturalists have had a vague knowledge of the existence of a species of bear in Tibet, but it is only comparatively recently that the creature has become fully known. So far back as the year 1853 that energetic Indian naturalist, the late Mr. Edward Blyth, gave a brief notice of a bear skin obtained by Dr. A. Campbell from Tibet, and suggested that if it proved to be distinct from the Himalayan black bear (of which he thought it might be merely a variety) it should be known as *Ursus pruinosus*, from its generally hoary colour. In 1892 the Natural History Museum received the skin of a small bear from Tibet, which is now mounted and exhibited in the lower mammal gallery. The skull which accompanied the skin showed that the animal had nothing to do with the Himalayan black bear, but was much more nearly allied to the Kashmir brown bear, although differing very remarkably in colour. The animal was not quite adult at the time of its death, when it appeared to have been in the winter coat; the hair on the back and flanks is long, but elsewhere it is shorter. All the hair is black at the base, but much of it is white in the terminal half, and the whole coloration is quite unlike that of any other bear. On the face and fore-part of the body white is the prevailing colour, although in places there are some black hairs, and these are more strongly developed about the forehead, ears, and the fore-part of the nape of the neck. On the hinder portion of the nape is a pure white band, or collar, followed by a nearly black transversely elliptical patch above the shoulder-blades. Over the rest of the body the hair is mingled black and white, so as to present a bluish tinge; and the hind-legs are similarly coloured, although the lower halves

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of the fore-limbs are almost completely black. The claws, which are of moderate length, are white.

In the autumn of 1897 the present writer had the opportunity, through the kindness of the Hon. A. E. Gathorne-Hardy, of seeing a second skin of this bear, which was obtained by Mr. Neil Malcolm in Tibet, and is described in the *Proceedings of the Zoological Society* for that year. This



FIG. 60.—Tibetan Blue Bear. From the *Proceedings of the Zoological Society*.

specimen differs very considerably from the first one, showing much less white on the back and shoulders, and having black (instead of nearly white) ears. It has a rufous band down the middle of the back, which is not observable in the mounted example. In fact, the second skin seems to differ as much from the first (if not more so) as does the Himalayan brown bear from its European relative. Probably these differences are only individual; but additional specimens are urgently required in order to determine this point, and also to show whether this bear is rightly regarded as a species by

itself, or whether it should be classed merely as a local race of the brown bear. And here it may be mentioned that there are considerable doubts whether it ought properly to have the name *Ursus pruinosus*, and if it should not be known as *U. lagomyarius*—a name applied by the late Colonel Przewalski to a bear from Tibet. Information is also required as to the size attained by this bear, the specimen in the British Museum being, as already said, immature.

Probably the blue bear is found in the forest districts in the neighbourhood of Lhasa, but on this point, as well as in regard to its habits, we have likewise no information.

A most noticeable feature in the British Museum specimen is the very curious approximation it makes to the type of coloration obtaining in the short-tailed panda (*Æluropus melanoleucus*) of the same country. This is especially shown by the presence of the pure white band on the hinder part of the nape of the neck, followed by the black patch between the shoulder-blades, and less so by the tendency to blackness on the ears and crown of the head. In Mr. Gathorne-Hardy's specimen, which is otherwise less like *Æluropus*, the ears are as black as in the latter. It has been suggested that this similarity in the coloration of these two animals is due to their living under similar physical conditions.

THE HIMALAYAN BLACK BEAR

(Ursus torquatus)

NATIVE NAMES.—*Rinch* or *Rich* and *Bhalu*, HINDUSTANI; *Mam*, BALUCHI; *Siyah-haput*, KASHMIRI; *Sanar* and *Hing-bong*, NEPALESE; *Dom*, BHOTIA; *Sona* OF THE LEPCHAS; *Magyen* OF THE LIMBOS; *Sutum* IN THE DAPHLA HILLS; *Situm* IN ABOR; *Mapol* OF THE GARO HILL TRIBES; *Muphur* and *Musu-bhurma*, KACHARI; *Vumpi*, KUKI; *Sawom*, MANIPURI; *Hughum*, *Thagua*, *Thega*, *Chup*, *Sevan*, AND *Sapa* OF THE NAGAS; *Wek-won*, BURMESE

(PLATE IX. FIG. 10)

Although a member of the typical genus *Ursus*, and possessing the same number of front teeth as the brown bear, the *Siyah-haput*, as the Himalayan black bear is called by the Kashmiri shikaris, is a very different animal to the former, easily distinguished by its black colour and conspicuous white gorget, as well as by the form of the skull and of the cheek-teeth. By some writers it is called *Ursus tibetanus*, but since it does not occur in Tibet, that name, although the earlier, is best discarded in favour of the one given above.

With the exception of the aforesaid gorget, or inverted crescent, on the chest, the ends of which are prolonged upwards in front of the shoulders, and the chin, which are white, the whole of the fur of this species is usually deep black throughout; but in some specimens the upper lip is whitish, and in others the nose, and, it is said, also the paws may be of a rusty brown colour. Unlike that of the snow-bear, the fur is at all seasons short and comparatively harsh, although sometimes showing a waved appearance. On the withers, however, it is somewhat longer,

this being most marked in the winter coat, when the appearance of a low hump is given. There is no trace of a woolly under-fur at the base of the hairs. The rather large ears are fringed with elongated hair, and the comparatively short but curved and strong claws are black. As a rule this species seems to average larger and heavier than the snow-bear, although not attaining the maximum length of the latter, and it certainly bulks larger than the sloth-bear of the plains. A fine old male has been recorded to measure 6 feet 5 inches in length from the muzzle to the root of the tail; but ordinary examples run from about 5 feet 6 inches to as little as 4 feet 8 inches in length, exclusive of the 3-inch tail. From 200 to 250 pounds is given as the usual weight, but this is probably exceeded by old animals in autumn.

It will be unnecessary to refer in detail to the characters of the skull of this species, but it may be mentioned that the median ridge on the hinder half of the upper surface is always much less developed than in the skull of the Himalayan brown bear, and that the profile forms a much more regular curve, the abrupt descent in the region of the eyes characteristic of the latter being absent.

The range of the Himalayan black bear extends from the confines of Persia through Baluchistan, the Khirtar range on the western border of Sind, and Afghanistan to the forest regions of the Himalaya, whence it is continued into Assam, Mergui, and Pegu, and thence into the south of China, Hainan, etc. There are statements as to the occurrence of this bear in the plains of Assam and Lower Bengal, but these (especially in regard to Bengal) require confirmation. Information is also required as to the exact limits of its range in the forest-regions of the Himalaya, although this probably includes the greater part of the middle and outer ranges. The species is found all over the Kashmir valley, as it is in Kishtwar and Chamba, but whether it occurs in the lower part of the Maru-Wardwan and Tilel valleys, it is difficult to ascertain. Personally,

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I have never seen it anywhere in Tilel. It never extends into the treeless districts north of Kashmir; but, curiously enough, the mam, or mumh, of Baluchistan, which Mr. Blanford identifies with the present species, must apparently inhabit open and more or less desert districts, where its mode of life must differ considerably from that of the Kashmir black bear. From 9000 to 10,000, or even 12,000 feet, is usually given as the maximum elevation to which this bear ascends during the summer in the Himalaya, while it is stated to descend in winter to 5000 feet or even less. It is, however, common in summer in many parts of the Kashmir valley, the greater portion of which is not much over 5000 feet above the sea-level.

Kashmiri shikaris are much more afraid of the black bear than they are of its brown relative; and although this may be partially due to the inately fiercer disposition of the latter, it also seems attributable to the different kinds of country in which the two animals are stalked. A brown bear when hard hit while grazing on a grassy hill-side can scarcely fail to roll headlong down the slope. On the other hand, a black bear when wounded on the comparatively flat ground of a forest has no such involuntary means of avoiding an encounter with its aggressor. Apart from this, there is no doubt that a far larger number of Kashmiris are mauled by black than by brown bears; but this is due to the circumstance that it is the former species which chiefly ascends the fruit-trees in the Kashmir valley. Five-and-twenty years ago it was quite a common thing to see three or four, or even more, black bears up a single mulberry or walnut tree; and the Kashmiri coolie thought nothing of ascending the same tree, armed with nothing better than a stout *lathi* (cudgel), in order to drive off the robbers. Consequently, either by falling to the ground in the endeavour to escape an enraged bear, or from a direct encounter with the latter, these simple people frequently received frightful injuries, from which, marvellous to relate, they, however, in most instances made a complete recovery.

Black bear stalking in the forests bordering the valley of Kashmir requires much more care than is expended in approaching the brown bear on the open hills above, the senses of sight and hearing being more strongly developed in the black than in the brown species. Many of these forests are very dense, so that it requires the eye of a practised shikari to detect the dark forms of the bears while searching for chestnuts on the ground without the advancing party being detected by the vigilant animals. Another method of shooting is by beating the small patches of forest found in many of the Kashmir *nalas*, when the bears march out deliberately in single file, with their curiously sedate steps and solemn expression of countenance, offering in most cases easy shots to the sportsman, who may, however, be deterred from taking aim by an irresistible tendency to laughter. For to behold, as the present writer has seen, a family party of five black bears walking solemnly out of covert, one after another, is certainly a comic sight. Still more ludicrous is it to see one of these animals descending—stern forwards—a fruit-tree in which he has been disturbed, and looking downwards every now and then over one shoulder to see who is below. Shooting them in the fruit-trees is perhaps taking a rather unfair advantage of the bears, but still it is often practised. Black bear shooting, although rather more exciting than stalking the brown species, is, however, by no means a very high class of sport, especially as the skins are never of any particular value, and in autumn, owing to the masses of yellow fat that are accumulated beneath them, are absolutely useless. In regard to the proper place to hit these animals, General Macintyre observes that “a bear, after being skinned and decapitated looks very like a corpulent man with short muscular limbs, and its vitals lie in much the same region, with regard to its shoulders, as those of a human being. It is flat-chested, and its fore-quarters are straight and placed far forward, so it is necessary to plant your bullet a good span behind the shoulder, and pretty high up. This, of course, only applies

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when there is time for a deliberate aim and a good position for taking it from." Maize, fruits, nuts, and roots form the main rations of the black bear; acorns, walnuts, and chestnuts affording a large portion of its nutriment during the autumn and winter months. And whereas this species digs much less in the ground for roots and bulbs than does its brown cousin, it is, as already said, much more prone to climb in search of fruits. Honey is another favourite article of diet, in search of which it will sometimes not hesitate to enter villages; indeed, it not unfrequently displays a tendency to resort to the neighbourhood of human habitations. It has been mentioned above that the brown bear will occasionally make a meal off a dead carcase, and the present species now and then displays a similar penchant for carrion. Nor is it by any means contented with dead animals, for it will not unfrequently attack and kill various domesticated species, including even cattle and ponies; and it is stated to be the most carnivorously disposed of any of the Indian bears.

Since it inhabits, as a rule, a somewhat lower and therefore warmer zone than its brown cousin, it would be only natural to suppose that the black bear is a less thorough hibernator. And such seems to be really the case, these bears undergoing only a partial sleep, safely ensconced in caves or hollow trees, and waking up in warmer intervals during the winter to refresh themselves by a walk and a feed. The following account of black bear hunting in Burma is taken from *The Asian* of 27th November 1896. The writer regarded the animals of which he was in pursuit as being the sloth-bear, although there is little doubt they really belonged to the present species. Describing his first sight of the party, the narrator says: "It was indeed a fine sight. A family of bears were taking their constitutional; a huge fellow had gone on to a log which had fallen across the stream and was half-way across; two others were having a pleasant scramble for the right of precedence, but without the heart-burnings of a state function. It was too good a chance to lose, so, forgetting for the moment our main aim,

I raised my rifle, and taking a steady shot, rolled the old bear off the log, the ball going into the shoulders and coming out at the mouth by some strange freak. The remaining two bolted back whence they had come before the smoke rolled away. By this time the rear men had found out that a whole family of the dreaded 'mee-ay-woon' (ground-bear) had been run into, and there was a general dropping of pots and pans and a swarming up trees. One man only so lost his head that he tried to squirm up a smooth tree about fifteen feet in girth and was unable to get up; he then made similar attempts at other trees, and was yet running round and round, though imbecile with faintness, when we came back for them. In the meanwhile I loaded and went forward with the old man to see our prize; he stopped about ten yards off, and I went beyond the fallen tree and looked down; there was the bear, and he was not dead yet but trying to rise. I was weighing the propriety of finishing him, but the old man held up his hand and pointed away to the bison valley. At this moment I heard horrible howls and growls behind me, and, turning round, saw the two bears which had bolted coming along at a gallop, now and then making grotesque jumps into the air. These animals had never heard a rifle shot before and had seen no living enemy either. They were probably not charging me but were returning to their friend. I was standing almost in their line, however, and a little covered by some young growth of bamboo. The wounded animal answered their calls and tried to climb out of the ravine, to my surprise; but as I anxiously watched him, in a quandary as to my next move in this fix which seemed turning into a tragedy, I saw him fall back again, and thus turned my whole attention to the real dangers. By this time the pair were about six paces from me; picking out the foremost and most savage one, I aimed for his breast and pulled triggers; he turned a somersault, and I reloaded in a flash, but before the smoke again lifted the pair had reached the 'kine' grass bordering the glade. One more glance at the huge fellow in the ravine

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and then I went forward to finish number two, who could be heard moaning in the kine about thirty paces off. I followed their trail, along which the grass was bent down, till I was about six paces off, but could only see the grass waving. Another step and I saw not one but both. The wounded one lay on his back whilst the other sat at his head and howled in sympathy, pawing him the while as if asking him to move on. I was full in view, but they failed to notice me. I was undecided what to do. There were already two wounded, and I did not wish to have another on my hands." Eventually two members of the party were bagged.

Like other members of the genus, this bear is a good swimmer, crossing without hesitation rivers of considerable size. The cubs are born in the spring, generally in a hollow tree-stem or among dense scrub-jungle. As the period of gestation in other bears is about six months, it is probably of the same approximate duration in the present species. This would make the pairing-season in the autumn; and since it is said that the old males and females are only found together at the season in question, the fact of the present writer having seen a family party of five in September or October, while Mr. Darrah, in his *Sport in the Highlands of Kashmir*, records seeing four in company in November, confirms this suggestion.

Two cubs are generally produced at a time, and these remain with their mother till they are well able to take care of themselves. When five individuals are found together, the party usually consists of the old male and female, one cub of the second year, and two of the first year. The writer has never heard of a party of six being seen in company.

In Japan the Himalayan black bear is replaced by a closely allied species; and in the New World this group appears to be represented by the North American black bear (*Ursus americanus*).

THE MALAY BEAR

*(Ursus malayanus)*NATIVE NAMES.—*Wek-won*, BURMESE ; *Bruang*, MALAY

(PLATE IX. Fig. 11)

By those who dabble in etymology there might appear to be some connection between the Malay *Bruang* and the term *Bruin*, so often applied to bears in Europe ; but since Malay has no relationship with the Aryan languages, the resemblance between the two words must apparently be due to a mere coincidence.

Although black in colour, the Malay bear is a very different animal to the preceding. Not only is it of smaller dimensions, but it is a lighter-built and longer-legged animal, with a shorter and broader head, a longer tongue, and a closer fur. Its gait too is different, being quicker and less deliberate than that of most other bears ; and the animal, judging from menagerie specimens, appears to be of a more restless disposition, pacing up and down for hours at a time, when it jerks its head from side to side with a peculiar motion, and now and then uttering a kind of plaintive grunt.

In addition to its broad head, short muzzle, and long tongue, the Malay bear is characterised by its small and rounded ears, on which the hair is uniformly short, instead of shaggy, as in the Himalayan black bear. The general colour of the short and close fur is, as already said, black, but in places it passes into brownish, and the muzzle, to beyond the eyes, together with the chin, has frequently a whitish tinge. A crescentic light-coloured gorget is very conspicuous on the chest, its two "horns" being broad, and sometimes uniting so as to form an oval

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or heart-shaped patch with a black centre ; in other instances the lower part of the patch may be prolonged into a white streak running between the fore-legs. In colour the light gorget, or patch, may vary from pure white, through yellow, to deep orange. It was at one time supposed that all the Bornean representatives of this bear had the patch orange, while in Malay examples it was lighter-coloured, and two species were accordingly made ; but it does not appear that there is any constant difference in this respect. Unlike those of the Himalayan black species, the claws of this bear are generally of a pale horn-colour.

Usually the Malay bear does not measure more than 4 feet from the muzzle to the root of the tail, the tail itself being about 2 inches ; but it has been suggested that in unusually large examples the length of the head and body may reach $4\frac{1}{2}$ feet.

Compared with those of the two preceding species, the skull of this bear is distinguishable at a glance by the shortness of the nasal region, and the great breadth across the temples, the cheek-bones forming greatly expanded arches. The molars, too, are relatively shorter and broader than in the other Indian bears.

The range of this little bear extends from the islands of Java, Sumatra, and Borneo, into the Malay Peninsula, and so on through Burma and Pegu to the Tenasserim province, Arakan, Chittagong, and the Garo Hills. Moreover, in a notice contributed to the *Proceedings of the Asiatic Society of Bengal* for 1899 (p. 11), Mr. G. C. Dudgeon gives reasons for believing that the species is found as far west as the Darjiling district. As in the case of so many other Malay animals, there is at present no sufficient evidence that the insular representatives of this bear can be distinguished either from one another or from the mainland form, so that local races cannot yet be established, although fuller materials may eventually render this possible. The nearest relative of the species seems to be the spectacled bear (*Ursus ornatus*) of the Chilian Andes—a remarkable

instance of the discontinuous distribution of a group, closely paralleled, however, in the case of the tapirs.

Since practically nothing definite has been ascertained with regard to the mode of life of the Malay bear in its wild state, we pass on to the consideration of the next representative of the family *Ursidae*.

THE SLOTH-BEAR

(*Melursus ursinus*)

NATIVE NAMES.—*Rinch* or *Rich*, *Bhalu*, and *Adamzad*, HINDUSTANI; *Bhaluk*, BENGALI; *Riksha*, SANSKRIT; *Aswal* or *Aswail*, MAHRATHI; *Yerid*, *Yedjal*, and *Asal* OF THE GONDS; *Bir-mendi*, ORAN; *Bana* OF THE HO-KOI; *Elugu*, TELEGU; *Kaddi* or *Karadi*, TAMIL AND CANARESE; *Pani-karadi*, MALABARI; *Usa*, CINGALESE

(PLATE IX. FIG. 12)

With its long, shaggy, and coarse black hair, mobile snout, long extensile tongue, and large and powerful claws, the sloth-bear, as it is commonly called by sportsmen, must be regarded by even the superficial observer as very distinct from the more typical representatives of the family *Ursidae*. And when the naturalist sets to work on its anatomy he finds still more important points of distinction, these being regarded as sufficient to justify the separation of the animal from the genus *Ursus*, and its reference to a group (*Melursus*) by itself. One of these points of difference is a reduction in the number of the upper front, or incisor, teeth from three to two pairs; while another is the very small proportional size of the cheek-teeth; and a third the excessive width, length, and concavity of the bony palate of the skull, and the great convexity of the profile of the latter. With the exception of the extremity

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of the snout, which is dirty grey, of a narrow white horseshoe-shaped gorget on the chest, and of the white claws, the sloth-bear is an entirely black animal; the long and shaggy hair, which attains a greater degree of elongation over the shoulders than elsewhere, gives such a generally untidy appearance that not even its best friend could say that it was a comely or graceful creature. In point of fact, it is downright ugly, although, no doubt, an admirable member of ursine society.

Generally speaking, this bear appears to be a somewhat smaller animal than the black Himalayan species, the length from the muzzle to the root of the tail varying between about $4\frac{1}{2}$ feet to $5\frac{3}{4}$ feet. The tail is, however, longer than in other bears, measuring from 4 to 5 inches in length, exclusive of the long hair with which it is clothed. About 280 pounds appears to be the average weight of old males in good condition; but one enormous specimen, which was probably unusually fat, is stated to have scaled as much as 320 pounds.

The sloth-bear is one of the comparatively few large mammals that appear to be restricted to peninsular India and Ceylon,¹ its range in the former country extending from near the foot of the Himalaya to Cape Comorin, and as far west as Kutch and Kathiawar, although farther north its range is limited by the great Indian desert. It is known to occur in Eastern and Northern Bengal, but whether it penetrates into Assam has yet to be demonstrated. Its fossilised remains have been discovered in a cave in the Karnul district of Madras, and the skull of a nearly allied extinct species has been obtained from the Siwalik Hills, no other representative of the genus *Melursus* being at present known.

Although in general a somewhat timid and retiring animal, the sloth-bear occasionally makes a ferocious and unprovoked attack on man, when it inflicts terrible wounds with its long talons, usually on the head

¹ In the absence of corroborative evidence, the capture of a young bear in Pegu, stated to have only four upper incisors, can scarcely be regarded as sufficient to prove the occurrence of this species to the east of the Bay of Bengal.

and face. Such wounds are, however, more frequently recovered from than are those received from the tiger. When such unprovoked attacks are made they generally arise from the bear being suddenly surprised, and not knowing how to escape; and as these animals are dull of sight and less quick-witted than either the tiger or the leopard, they find more difficulty in deciding on their line of flight, so that such encounters are of more frequent occurrence than in the case of the two animals last mentioned. A female bear with her young ones is more prone to attack than is a solitary individual; and, of course, one brought to bay is at all times an awkward and dangerous customer. Still there appear to be instances where these bears made attacks upon man without any assignable reason whatever. It is often stated that when at close quarters they rise on their hind-legs for the final rush; but this is denied by the late Mr. G. P. Sanderson (from whose account many of the following observations are taken), and it is quite certain that the sloth-bear does not "hug" its victim after the fashion popularly, but erroneously, attributed to other members of the bear tribe.

As an illustration of the power of these animals, it may be mentioned that during the winter of 1897-98 an encounter took place between a polar bear and an Indian sloth-bear at Sanger's Circus, in which the latter came off an easy victor. It seems at first sight remarkable that such a powerful animal as a polar bear should have been so easily vanquished, but it was the cruelly long claws of the Indian that doubtless did the business, while the length and shagginess of his coat would protect him from the teeth and shorter talons of his northern antagonist.

It is commonly asserted by sportsmen that when one of two sloth-bears in company is struck by a bullet, it immediately institutes a savage assault on its companion. Mr. Sanderson, however, throws doubt on the truth of this statement, although, as already mentioned, the present writer can vouch for its correctness in the case of the Himalayan brown bear.

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The novice in tracking may easily mistake the footprints of a sloth-bear for those of a man, but a closer inspection will show that there are four where there should be only two, while a further examination will reveal the fact that bear-*spoor* is shorter and wider than that left by the human foot.

Jungly hill districts, where there are numerous small isolated outliers at the foot of the main ranges, are the favourite haunts of the sloth-bear, the most favoured situations being those where numerous large boulders cover the surface of the ground, or where the rocks are fissured by ravines and crevasses, or hollowed out into caverns. In such cool retreats, protected from the fierce rays of the sun, and safe from the attacks of insect plagues, the bears pass the hottest hours of the day, issuing forth at evening to feed. Where the ground is of such a nature as not to show their footprints, the presence of these animals may frequently be revealed to the sportsman by the curious humming sound proceeding from the depths of the rocks, produced, it is said, by the bears sucking their paws. Although the greater part of the day is usually passed idly in such subterranean retreats, in cloudy weather, and more especially at the commencement of the rainy season, when the hardness of the ground during the preceding hot weather has prevented them from obtaining a sufficient supply of insects by digging, they may be seen abroad at all hours in districts where they are but little disturbed, busily engaged in searching for food. It must not, however, be supposed that rock-fissures and caverns are the only places where sloth-bears are to be found, for, in the absence of these, they will be perfectly content to lie hidden in scrub-jungle, at the root of a clump of a tall bamboo, or even in the open beneath some shady tree.

Except during the season when the female is suckling her cubs, both sexes may frequently be seen in company, but when three bears are observed together, these generally comprise a female and a couple of cubs.

And if it be a fact that, instead of twins, triplets are occasionally produced at a birth, a party of four might sometimes come under the same description. The females display great affection for their offspring, carrying them about on their backs during their nocturnal prowls until of such a size that there is only room for one, when the other has perforce to walk behind alone, till such time as its fellow is discarded from the maternal back, and has likewise to trust to its own limbs for the means of locomotion. During the time that both cubs are permitted to ride, they are carried by the mother to the feeding-grounds, on arrival at which they promptly dismount, scrambling up again to the same seat on the approach of danger. At the time that the two sexes are in company an equal degree of affection is displayed by the male towards his partner, and when one is wounded, a chorus of piercing shrieks is immediately raised by its companion. When commenting on the alleged statement that one wounded sloth-bear will attack its fellow, Mr. Sanderson observes that "a wounded bear's companions generally rush to him to ascertain the cause of his grief, joining the while in his cries, when he, not being in the best of humours, lays hold of them, and a fight ensues, brought about by the affectionate, but ill-timed solicitude of his friends."

The very small size of the cheek-teeth of the sloth-bear would alone be sufficient to indicate that its diet consists neither of flesh nor of vegetable substances that require much trituration. And we find that, although by no means averse to an occasional meal of carrion, these animals subsist to a great extent on ants and termites, or white ants, together with the grubs of beetles and other insects. And for digging out such creatures from their subterranean haunts, as well as for opening out the nests of wild bees, for the sake of the honey they love so well, their long curved claws are admirably adapted. Regardless of the stings of either ants or bees, the sloth-bear plunges its muzzle straight into their nests, licking up the smaller insects or the honey of the larger ones with its long extensile

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tongue. Although the bees must almost certainly make their presence felt in an unpleasant manner on the naked nose of the bear, the shaggy fur with which its hide is elsewhere protected must doubtless render those weapons of offence innocuous. Fruit of various kinds, as well as the fleshy flowers of trees like the mohwa, which at times fall in showers on the ground, form no inconsiderable portion of the food of the sloth-bear. And being, like most of his kind, an expert climber, these animals ascend trees not only in search of fruits and honey, but also to levy toll on the sweet contents of the pots hung by the natives on the trunks of the date-palm to receive the juice from which a fermented liquor is manufactured. According to native reports, the bears, being clumsy creatures, not only drink the liquors, but smash a considerable number of the pots, and at times become helplessly intoxicated from the effects of the fermented palm-sap.

The presence of sloth-bears in a district where there are fruit-trees or date-palms is always indicated by the marks made by their claws as they ascend and descend the stems. And their claw-marks are likewise visible where they have been digging for white ants. Many of the latter, as well as wood-boring grubs, are drawn out from their retreats by the sloth-bear's great power of suction. In this operation the animal first gives a great expiratory puff from its nose, which is placed close to the nest or hole, in order to clear away the dust, and then takes an equally deep inspiration. The sound of these respiratory movements is audible at a great distance.

As already mentioned, the visual powers of these creatures are by no means strong, and since their hearing is but little better, it is not by any means difficult to approach them within a very short distance. Their strange antics and uncouth gambols may thus be easily watched. When feeding on a hill-side and suddenly disturbed by an intruder they are said to show no hesitation in allowing themselves to roll headlong into the valley below.

Although exterminated or much reduced in numbers in many districts where it once abounded, the sloth-bear is still a common animal over a large portion of India. Three methods of hunting are in common vogue. The one plan is to discover the cave, or other lair of the animal, and to take up a position above or near the entrance to the same during the night while the occupant is abroad, and patiently await his return soon after dawn. This, however, is but weary work ; and many sportsmen prefer the plan of driving the bear from covert with a line of beaters. This, however, can only be effected when the animal is in scrub-jungle or among sugar-cane or other cultivated crops. The third and most sportsmanlike method is by tracking, when the bear is followed up to its feeding-place (which it frequently does not leave till the morning is comparatively well advanced), or in some cases to its lair, when this is in the open. In the Mysore jungles tracking is most easy during the months of September and October, when a plain trail is always left through the dewy grass, which at this season of the year is about a couple of feet in height, and therefore easy to traverse. In regard to this method, Mr. Sanderson observes that "bear-shooting conducted on proper principles, with two or three bears afoot together, lacks neither excitement nor amusement. It is not very dangerous sport, as the animal can be so easily seen, whilst he is not so active as a tiger or panther. Still he is very tough, and to any one who would value him for his demonstrations he would appear sufficiently formidable. If a bear charges, he can generally be killed without more ado by a shot in the head when within two paces."

The same sportsman also practised bear-tracking with the aid of dogs. According to his experience, a sloth-bear, despite its great muscular power and bodily activity, may be easily held by three bull-terriers, one of which should be trained to seize by the tender muzzle, which affords a good grip and renders the animal almost helpless. It might have been thought that the bear's claws would inflict grievous harm on its canine

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assailants, but harmful as are the former to the tender skin of man, to the tough and yielding hide of a dog they do but little damage.

In conclusion, it may be added that Sir Samuel Baker, who regarded it as one of the most vicious animals with which he was acquainted, records two occasions where a sloth-bear has attacked an elephant, one of these instances being altogether unprovoked.

THE RED MARMOT

(*Arctomys caudatus*)

NATIVE NAME.—*Drun*, KASHMIRI

The traveller who for the first time crosses the range forming the north-eastern barrier of Kashmir—whether his route takes him into Maru-Wardwan *vid* the Margan Pass, to Dras by the Zogi-la, or to Tilel and so on to Astor by the Bandipur and Tragbal road—will be startled as he nears the summit by loud whistling screams proceeding simultaneously from several points around him. On looking about to discover the source of these strange cries, he will catch sight of a number of little red and black animals standing up on their hind-quarters, and looking inquisitively round to ascertain the business of the intruder on their bleak domains. On approaching one of these marmots, for such they are, the traveller will find that when he comes within a certain distance, the little creature will disappear suddenly, with a parting scream, into the recesses of its burrow, on the entrance-mound of which it had been sitting, to venture forth once again when the danger appears to be over.

Marmots are burrowing members of the squirrel family, easily recognised by their comparatively large size, small ears, and moderately long bushy tails. The present species, which may be compared in size to a cat,

is one of the largest and most brilliantly coloured of the Himalayan and Tibetan members of the group, and is characterised, among other features, by the length of its tail, which is approximately equal to half that of the head and body. The general colour of the moderately long and somewhat harsh fur varies from yellowish tawny to bright orange red, with more or less of black on the back, and the tip of the tail of the same sable hue. A blackish patch also surrounds the eye, the rest of the face being brown, and the under-parts of the body and the legs reddish brown. A good-sized specimen will measure about 3 feet, or just over, in total length; 12 or 13 inches being taken up by the tail.

Marmots are quite unknown on the ranges to the south of the Kashmir valley, and belong rather to the Tibetan than to the proper Himalayan fauna. The red marmot, as the present species, from its distinctly rufous tinge of coloration, is commonly called, is found on all the ranges to the north and north-east of the valley of Kashmir, at heights varying from about 8000 to 14,000 feet, and also extends northwards through Astor to that bleak and inhospitable plateau known as Deosai, or the Devil's Plains.

In Rupshu and Ladak, and thence northwards to the Kuen-Lun and eastwards to Lhasa, at elevations of from 13,000 to 18,000 feet or more, the place of this species is taken by the Tibetan marmot (*A. himalayanus*), distinguished by its relatively shorter tail and greyer tone of colour. On the other hand, in Sikhim, Nepal, Bhutan, and the neighbouring districts of the Eastern Himalaya we have the much smaller Hodgson's marmot (*A. hodgsoni*), in which the proportionate length of the tail is still less than in the last, not being quite one-third that of the head and body. Even the above do not exhaust the list of species found in the area treated of in this volume, since there is one peculiar form (*A. dichrous*) in Northern Afghanistan, and another (*A. robustus*) in Eastern and North-Eastern Tibet.

It is just a question whether or no marmots should be included among

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“game animals.” Their skins are handsomely coloured but too coarse and wiry to be satisfactory from the furrier’s point of view ; and although they are collected by some sportsmen, they are not regarded with much favour by the majority.

Marmots feed chiefly on roots, and live in colonies, excavating their own burrows. In shooting them, it is essential that they should be killed outright at the first shot, as otherwise they are sure to drag themselves down their burrows out of reach of the sportsman’s arm before he can get up to the burrow, to the entrance of which they always resort when danger threatens. After being once fired at and missed they will generally reappear after a short interval ; but, in the present writer’s experience, after having been twice shot at, they consider discretion the better part of valour, and remain securely under ground. In the absence of a rook-rifle, the present writer used to kill marmots by shooting them in the head with a charge from a shot-gun, but there seems little doubt that the former weapon would be the better for this description of sport.

THE BLACK-NAPED HARE

(*Lepus nigricollis*)

NATIVE NAMES.—*Khargosh*, HINDUSTANI ; *Sassa*, MAHRATHI ; *Malla*, CANARESE ; *Musal*, TAMIL ; *Kundeli* AND *Chourapilli*, TELEGU ; *Moiu*, MALABARI ; *Hava*, CINGALESE

In the *Great and Small Game of Africa*, to which, as stated elsewhere, the present volume is intended to form a companion, the hares, perhaps from considerations of space, are omitted. They clearly come, however, under the designation of “small game,” and the species found in the area treated of in this volume accordingly receive brief mention. The

sportsman accustomed to the hares of Europe will be somewhat surprised to see the Indian species, when hunted, not unfrequently take refuge in holes. Except in the case of the bristly rabbit (*Lepus hispidus*) of the Eastern Himalaya and Assam—which receives no further mention here—such holes are not, however, dug by the hares themselves, but are the burrows of other animals—such as foxes—they may encounter in their flight. In default of holes, hares in the Nilgiris when coursed sometimes seek an asylum in the hollow trunk of a tree.

The present species, which is the hare of Southern India and Ceylon, can be distinguished at a glance from all the rest by the presence of a large black patch on the back of the neck. It is found in the peninsula to the south of the Godaveri river, and is met with commonly on the Nilgiris, as it is on the plateau of Newera Ellia in Ceylon.

THE NORTH-INDIAN HARE

(*Lepus ruficaudatus*)

NATIVE NAMES.—*Khargosh*, PERSIAN AND HINDUSTANI ; *Khara*, *Susra*, OR *Sassa*, HINDUSTANI AND BENGALI ; *Lambha* OR *Lambhana*, HINDUSTANI ; *Malol* OF THE GONDS ; *Kulkai* OF THE KOLS AND SANTALS ; *Koarli*, KORKU ; *Manye* OF THE HILL-TRIBES OF RAJMEHAL

In many parts of the world there is a curious tendency to compare long-eared animals with the despised but useful ass. Thus the Persian name for a hare (*khargosh*) means the donkey-eared animal, while in the United States another member of the same genus is designated the “jackass rabbit.” Similarly, in Argentina the name “mulita” (little mule) is applied to an unusually long-eared species of armadillo.

From the other Oriental members of the genus *Lepus* (apart from the

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black-naped species), the common hare of Northern India is distinguished by the harsh nature of its fur and the reddish-brown colour of the upper surface of the tail, the ears being nearly naked. The general colour of the upper-parts is light reddish brown, mingled with black on the face and back, the chest and legs being more decidedly red, and the chin, the upper portion of the throat, and the under-parts white. A narrow black line margins the tips of the outer surface of the ears. With the exception of Western Rajputana, Sind, and the south-western districts of the Punjab, where its place is taken by the next species, this hare is found throughout the greater part of Northern India, ranging from Hazara in the north-west to Assam in the east. It is known to occur at least as far south in the peninsula as the valley of the Godaveri, and it may possibly even extend into parts of the Deccan. Its favourite haunts are among grass and bushes in dry districts, whether cultivated or jungle. It affords fair sport when coursed with greyhounds in districts where the ground is favourable for coursing.

All hares have a groove in the upper front teeth, which, in some species, penetrates the interior of the tooth in a branching form, and in the present species the complexity of this branching reaches its highest development.

THE SIND HARE

(*Lepus dayanus*)

NATIVE NAMES.—*Sassa*, *Saho*, or *Seher*, SINDI

This, the common hare of North-Western India, is readily distinguished from the preceding species by the soft and silky nature of its fur and the blackish-brown colour of the upper surface of the tail. It is also a greyer animal, the general hue of the fur on the upper-parts being greyish brown with the usual admixture of black.

The range of this well-marked species includes the more or less sandy and arid tracts of Sind, Kutch, the Indian Desert, and probably a portion of the Punjab. It is a rather smaller animal than the last, the length of the head and body being about 17 inches, instead of reaching to between 18 and 20 inches.

THE BURMESE HARE

(*Lepus peguensis*)

NATIVE NAMES.—*Yun* AND *Phu-goung*, BURMESE

In common with the Afghan hare, the present species differs from the two last noticed by having the upper surface of the tail jet black, its other special characteristics being the generally rufous tinge of the fur and the presence of a large black patch at the tip of the outer surface of each ear. The fur of the upper-parts is a mixture of rufous and black, while the under-parts are white, a sharp line marking the limits of the dark and light areas. This hare, which is absent from the coast region and dense forest tracts, inhabits a considerable portion of Burma, although its precise limits are not yet ascertained.

THE AFGHAN HARE

(*Lepus tibetanus*)

NATIVE NAME.—*Khargosh*, PERSIAN AND PUSHTU

The generally greyer tone of the fur seems to be the best and most easily recognisable feature by which this species may be distinguished from the last, which it resembles in the black upper surface of the tail. The general colour of the soft fur of the upper-parts varies from light

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greyish to light reddish brown mingled with black, the rump of some examples exhibiting an ashy tinge, and the under-parts, with the exception of the light brown chest, being white. Externally the ears are brown at the sides and buff behind, but towards the tips they become gradually black; frequently their entire margins are buff. Nineteen inches is given as the usual length of the head and body, against 21 inches in the Sind hare.

The range of this hare includes a large portion of the Upper Indus valley, notably in Baltistan, or Little Tibet, and extends towards the west over the greater part of Afghanistan and Baluchistan, the species being met with in the neighbourhood of Quetta and in the Khirtar range of Sind. Although found at considerably higher levels in Baltistan, in Baluchistan (where it was first described under the name of *L. craspedotis* by Mr. W. T. Blanford), it descends as low as about 500 feet above the sea. It is stated to have been obtained from the Nubra valley, in Ladak.

TIBETAN HARES

(*Lepus oiostolus* AND *hypsihius*)

NATIVE NAME.—*Rigong*, TIBETAN

The two species above named are nearly allied to the mountain hare (*L. timidus*¹) of Europe, of which indeed they may prove to be nothing more than local races, and differ from all the hares noticed above in having the upper surface of the tail almost or completely white. In accordance with the nature of the climate of the elevated region in which they dwell, the fur is very soft, thick, and woolly, and in the species first-named, at any rate, the ears are densely furred on their external

¹ This name is often incorrectly applied to the English hare, of which the proper title is *L. europæus*.

surface. This same species (*L. oiostolus*), often called the woolly hare, is the smaller of the two, but has relatively longer ears, which considerably exceed the head in length. Its general colour on the upper-parts is yellowish brown mixed with dark brown, the rump being ashy grey, the tail nearly white, the fore part of the neck and chest pale fawn, and the rest of the under-parts white. This hare occurs typically in that part of Tibet which lies immediately north of Nepal and Sikkim, whence skins were obtained and named by Brian Hodgson. In all probability it also extends farther towards the east, and specimens have been obtained from high valleys to the south of the great snowy range in the Sikkim district.

The Ladak, or upland, hare (*L. hypsibius*) is very probably nothing more than a local race of the last, from which it is said to differ by its somewhat superior size and shorter ears. The tail is invariably pure white throughout, and the blue-grey tint of the hind-quarters stands out in striking contrast to the brown of the rest of the back.

This hare is definitely known from the higher valleys of Ladak, such as Chang-chenmo, as well as from the plateau of Rupshu, being met with at elevations between 14,000 and 15,000 feet, or even more, above the sea. The present writer has, however, shot hares in plantations a few miles higher up the Indus valley than the town of Leh, at considerably lower elevations than the foregoing, which he is inclined to believe belonged to the present form. A hare from North Tibet and Kansu, identified by Dr. E. Büchner, of St. Petersburg, with *L. oiostolus*, is regarded by Mr. Blanford as more probably representing either a variety of *L. hypsibius* or an undescribed species.

In the small patches of *Eleagnus* jungle growing along the water-courses in the neighbourhood of Chang-chenmo these blue hares, as they are commonly called by sportsmen, are extraordinarily abundant, and enough to supply the traveller's camp with food for a week or more may often be shot in the course of a few minutes. In the opinion of the present writer

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(who, by the way, once walked over a pass of 18,000 feet in height carrying a double-barrelled gun and a brace of these hares on his shoulder) their flesh is decidedly superior to that of the hares of the plains of India, although this favourable verdict may be partly owing to the keen appetite developed by camp-life in Ladak. Anyway, blue-hare soup is certainly most excellent.



FIG. 61.—Skull and Antlers of Shou. From a specimen in the British Museum.

APPENDIX

GAUR-SHOOTING IN UPPER BURMA

THE gaur, or bison of Indian sportsmen, is found in all the heavy forests of Burma from the northern frontier down to the Malay States. Full-grown Burmese bulls are quite black, and have a distinct dewlap called "paby-in" by the Burmese ; they grow to a huge size. I have shot one 6 feet 2 inches at the shoulder, and have heard of even larger specimens shot by friends.

In my opinion, with the exception of the elephant, the gaur is the most dangerous animal one can hunt in Burma ; solitary bulls are nearly always cantankerous brutes, and are liable to charge the smoke of one's rifle, and it is always even chances that a wounded one will charge when followed, and what is more, display great cunning in choosing ground for the charge in which all the odds are in his favour. The Burmese hunters fully realise this, and even the oldest and most reckless among them display great caution in following the animal wounded or unwounded, as besides being a determined brute, he is also most wary. Going after herds is not much fun, as one nearly always suddenly comes face to face with an outlying cow, who gives the herd timely warning by the well-known double snort which every one who has followed gaur has heard, and this is often the last evidence of them except the crashing of the bamboos as the flying herd dash away over any kind of country.

The best time to shoot gaur is in April and May ; the jungle is then burnt, tracking is easy, the new grass has come up, and the animals do not wander far. The sportsman should rise before dawn, and try and be on any open grass-land near the heavy forest or foot-hills by daybreak. If he skirt along looking for tracks, he will be almost certain to find the huge print of a solitary bull sooner or later, sometimes

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of two bulls, "uncle and nephew" of the Burmans. He should then start tracking with the utmost care as if every step was the last of the stalk (wearing rubber or jute soles), and keep a very sharp look-out. If he has luck, and if it is very early, he may come on the animal feeding; it will stare at him for a second or two, but after one snort it is off. If the day is getting on, say 8.30 or 9, be most careful about approaching any evergreen cover or shade, as the gaur retires to shade to rest during the day; if the bush is thick it is best to betake oneself to some shade and wait till about 4 o'clock before taking up the track again, as at about that time the bull will move out and start feeding again, not be so much on the look-out, and so give one a better chance; however, there is a great deal in luck. The best gaur I ever shot was my first and I walked into dense jungle after him, found him lying down, got a snap-shot at him as he jumped up, and, with the beginner's luck, broke his neck. The next best time, if one can stand the hardships (rain, damp, leeches, mosquitoes, fever, etc.), is in the rains, say in August and September, when the new shoots of the bamboo are sprouting; inquire if any salt-licks are near, if so, go and look for tracks, then follow up the single ones if they are fresh; food is then very plentiful, and tracking, owing to the softness of the ground, mere child's play; one also can move so quietly in spite of the thickness of the jungle as to be certain of coming up with the animal. Personally, I only go after gaur twice a year, in April and May and in August and September. Track very slowly; one is sure to come up with gaur if the tracks are of the same day, and hurry always means noise; in the rains there is no wind in the forest, so he will not smell you. Gaur feed very quietly, and except in the rains no sound of feeding is heard. However, they are noisy beasts as regards calling. I have heard four kinds of noise—(a) the double snort, (b) the deep "moo" of a solitary animal, (c) a deep bellow, (d) and a most extraordinary noise, something between the trumpet of an elephant and the yell of a wounded bear; it was in May 1899 that I heard an old cow making this noise, having been lucky enough to get within about 30 yards of the herd.

Up to 1898 I used for five years a 12-bore paradox, made specially heavy, burning $4\frac{1}{2}$ drams of powder, and I killed very many with this; but I was unlucky enough to be charged in thick bush by a wounded animal, and though I hit the beast twice as it came for me, I was knocked down, and was only saved by the determined

pluck of my bull-terrier who persistently hung on to the brute's nose while over me, and gave me time to stagger off. My hunter spent the whole night in a tree with the same animal at the foot, as we had only brought one gun, the paradox, which had in the charge been hurled out of my hands. Afterwards I bought an 8-bore paradox, which I found excellent, as in Burma 30 yards is a long shot at gaur; but the gun is heavy and makes a great amount of smoke. If using a rifle with black powder, step aside out of the smoke directly after firing, as often the beast rushes at the smoke. Gaur-flesh, although dark, is good, but sometimes strongly flavoured, the tongue being the best part.

C. W. A. BRUCE.

YAK-SHOOTING IN LADAK

Very few bull yak cross the Tibetan frontier into Ladak, and to hunt for them in Tibet, where in places I believe they exist in hundreds, is running the risk of being turned back by the Tibetans. In 1891 I reached the Chang-chenmo valley in Ladak during early spring, intending to hunt for yak and antelope, and by being first on the ground thought there would be a good chance of finding the former; but although I hunted over most of the ground, I was never fortunate enough to see a bull, and shot, in mistake for bulls, six cows in splendid winter coats, the long hair on their flanks almost touching the ground. If one had ever seen a bull I do not fancy one could make the mistake, owing to their immensely superior size, but my old Tibetan shikari, who had seen several bulls shot, in each case assured me that the animals I was stalking were bulls, and I was naturally much disappointed to find I had secured cows only. The winter of 1890-91 was one of the most severe ever known in Ladak, and I saw several dead cow yak and an average of three dead kiang daily, and this severity, I think, had kept the yak out of the Chang-chenmo valley.

The yak is generally found at extreme elevations. I think I have followed them up to 19,500 feet, and at Kiepsang, the place where I first saw yak, my camp was pitched at 17,500 feet, and a bitterly cold spot it was, with a terrific wind always blowing.

Going up a nala one day, nearest my camp, a yak suddenly jumped up and made up the hill; the shikaris, after examining the tracks, pronounced it a small bull.

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The rest of that day I spent in stalking it, but owing to an ever-shifting wind never got within shot, and each time the yak winded us it put about a mile between us in a short space, and no one but those who have tried it know, owing to the elevation, what slow work it is climbing those Ladak hills. The following day we took up the tracks where we had last seen the yak disappear over a ridge, and had not gone far when we saw it feeding within range. Taking off my shoes I crept up a little nearer, and then stood up, as it was feeding with its head turned away from me; waiting until it turned and made off down hill, I gave it two shots from a '450 express rifle, with a small-hole bullet, hitting it in the ribs and bringing it to its knees, and finished it with a third shot—very disappointed to find it a cow, but its coat was in splendid order, and we proceeded to skin it before the carcase became frozen. On the way home we saw three more yak which looked like bulls, and which we left for the next day. To get the wind right we took the same course as yesterday, which meant a lot of climbing—dropping on the way five men to bring in the meat of the yak killed yesterday. We proceeded to the top of a high ridge, from which we made out the yak feeding just under the snow; again we had a stiff climb to get the wind right. On reaching our point we saw the yak coming down the nala, and as soon as they had passed out of sight we rattled down a steep snow slope to the bottom and soon came on the yaks lying down, round a bend to our right. One I shot in that position and it never moved, the other two made off along the hill-side, but a few more shots brought them both rolling down the hill to the bottom of the nala—cows again, but very big ones with fine coats.

My experience of yak is that they have great powers of scenting one at a long distance, but are not, like the argali, very quick-sighted, and if the wind only remains steady there is no great difficulty in approaching them. I consider a '450 or '500 express with a solid or small-hole bullet, or even a '303, quite sufficient to kill a yak, for he is a large beast, and even if not stopped by the first shot, there ought to be no difficulty in hitting him a second time in that open country.

H. C. V. HUNTER.

BANTING OR HSAING-SHOOTING IN BURMA

The Burmese hsaing is found practically all over Burma, except of course in the central dry zone, which, being almost devoid of covert except scrub, could not afford any shelter for such a large animal. The hsaing loves open engdaing forest, *i.e.* a forest in which *Dipterocarpus tuberculatus* is the predominant tree. This forest looks very much to the casual observer like a sal forest, so sportsmen who have shot in India will know the class of jungle I mean. The best time of the year to go after hsaing is during the months of March, April, and May, that is, during the hot weather; the jungle is then burnt, making tracking easy, and if one waits till the young grass is about 6 inches high one will not have to go far, as owing to the quantity of food (tender and green, after the short commons they have been on) they will not wander far. Shooting hsaing is only a question of sticking to it; if he knows hsaing inhabit a certain forest, and does not fear heat, thirst, and miles of tramping in the blazing sun, the sportsman may be certain of getting the bull if he can shoot decently straight. When I first started hsaing-shooting I used a 12-bore paradox, taking $4\frac{1}{2}$ drams of powder. With this weapon I got over a dozen, but one day being out with a .303 in hand, and seeing a bull hsaing a long way out, I fired at him after a long chase. I eventually finished him off with an 8-bore. On examination I found that the solid .303 bullet had gone clean through, and that owing to internal bleeding I had managed to come up with him, though it took two days. I then went out next day with .303 and got a long shot at a smaller bull running away. I hit him with a Holland peg-bullet, just behind the short ribs; the bullet travelled forward, and the animal fell stone-dead after running about 50 yards. Since then I have always used the .303 with Holland's peg-bullet. The last time I fired at a hsaing, in January 1900, the bull was about 100 yards away looking at me. I hit him low down in the neck; the bullet travelled right into the body-cavity, making a fearful mess of his inside, and he collapsed just where he had been standing. In future I have no desire to use any other weapon or bullet, though I should of course have some heavy weapon carried behind as a "charge-stopper" in case of accidents. I strongly recommend a smokeless powder, since one can get two or three shots, as the

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herd cannot see from whence the danger proceeds, and remain gazing about if one takes the precaution to stand still. In starting out with a hunter, it is important to impress on him that he is on no account to utter a word, and that he must track as slowly as possible. Hsaing very often graze along, and then return on their tracks to choose a place to sleep in, and it is most annoying to just see them about 30 yards away, hear a snort, fire a snap-shot, and then prepare to track for about 3 miles before one can hope to come up with them again. The sportsman should start before dawn, and endeavour to get to the grazing-ground, or near a salt-lick or earth-scraps, by dawn; he should move slowly, keeping a very sharp look-out, and if hsaing are seen stand motionless. They will often after staring hard at one either go on grazing or move slowly off. One can easily then stalk near enough for a shot, but the sportsman must be sure and keep the wind. They have poor eyesight, but a very keen sense of hearing and smell, particularly the latter. If hsaing are disturbed and run off, there is no occasion for despair. My experience is that they rarely go far unless they have been much hunted, and very often travel in a circle back to the ground where they were originally disturbed. I have fired three times in the same day at a herd. The bull is usually last in a herd. During the rains, if one can stand the damp and discomfort, is the best season; August is another excellent time to shoot hsaing. The bamboo is then sprouting, and the young shoots look like great thick heads of asparagus. Hsaing are passionately fond of this, and one can get very close to them while they are feeding; but I have never had good luck, as I have always run into an old cow or a calf, since, owing to the thickness of the jungle, one cannot see the whereabouts of the bull as one can in the hot weather in the open engdaing. My experience is that hsaing will always run away if they can, even when wounded. In May 1899 I fired at a bull and wounded him badly, but too far back. He went into some very thick thorny jungle, and I tracked him for three hours through this, continually hearing him only a few yards ahead. I certainly would not have gone after a wounded gaur in similar jungle. He at last broke out of this and went fast through a patch of open forest towards a little Chin village. When I got to the village I asked if they had seen the hsaing, and was told that the dogs had bayed him for some time in the village plantain-grove. I sat down at the edge of this grove to have breakfast and a drink. We had a long

consultation as to what we should do, and then started again; and, incredible as it may seem, the hsaing was all the time lying down only 10 yards behind me in the plantains when I came on him. I was so astonished that I fired hurriedly with my 12-bore, hitting him high in the neck. If ever a beast should have charged it was then, but, instead, he rushed up the hill and stood on the brow about 50 yards away looking down at us. Seizing my 8-bore I rushed up to him and stood by a big tree about 7 yards off to see what he would do. He stamped his foot, shook his head, and had evidently at last made up his mind to charge as I dropped him dead.

C. W. A. BRUCE.

HIMALAYAN ARGALI-SHOOTING

To my mind there is no big game shooting that I have experienced to equal the pursuit of the Himalayan argali, and no animal more difficult to secure, for not only are big rams very scarce in Ladak—the only country, so far as I know, where the European sportsman can hunt them—but they have everything in their favour; the mountain sides are generally very bare of any cover, the wind is extremely shifty, owing to the extreme elevation—one is seldom below 14,000 feet—the air is so rarefied that climbing is very slow work indeed, and the cold and winds in the early spring, the time when I was after them, are awful. The great difficulty in judging distance accurately in Ladak is another factor in their favour, and I usually found I had under-estimated the distance by 50 yards, but the modern rifle with its low trajectory ought to simplify this. I used a .450 express, which is an efficient rifle if one can gauge the distance, but with an express there is a considerable drop in the bullet at anything like 200 yards, and it is more than annoying, when perhaps one has spent days in the pursuit of a good head, to see one's bullet strike a few inches too low. I made it a rule, after experiencing the above, always to put up the 200 yards' sight, unless I could be absolutely certain that the beast was within 100 yards. The argali generally remain for weeks on the same ground unless shot at, and although one may fail for several consecutive days to approach within shot, patience is generally rewarded at last.

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On March 15, 1891, a year of exceptionally heavy snow, I started for a second trip to Ladak, and owing to difficulty in getting coolies, and very deep snow, did not reach Leh until April 10, after many very tiring marches. I made my way at once for the Chang-chenmo valley, passing the Pangkong lake, which was covered with ice thick enough to have carried an elephant. I reached Phobrang on the 28th of April, where I heard that three argali had been seen five days previously. The following day I went out to look for them, but it was not until late in the evening that I spied them below us—one good one, a fair one, and a small one. They were in an impossible place for a stalk, but at last moved towards a rocky hill, which I made for at once, but arrived there a few minutes too late, for when we reached the spot from which I hoped to have my shot, they had crossed a hill and were 350 yards away, much too far to risk a shot. Whether they winded us, or were put off by a man with some goats about 500 yards from them, I do not know, but they suddenly tore across an open plain and ascended a hill on the other side, where I left them, and I had a long walk of about seven miles back to camp. Next day I took out some bedding to sleep out nearer the ground on which I had left the rams; snow fell for a long time, but at last it cleared up, and we took up yesterday's tracks, and saw the rams at the head of a nala about a mile away. We started in a snow-storm to stalk them, but unfortunately on the way put up a kiang—that curse of stalking in Ladak—which went straight towards the rams, and of course, on arriving where I had last seen them, they could not be found, and as owing to the falling snow we could not make out which way they had gone, we returned to camp, arriving just before dark. The next day I sent away the two ponies I had with me, to rejoin my main camp which had orders to start for the Chang-chenmo valley, and I went again to look for the rams, but as their tracks led quite out of my line of march, I gave them up—this was the 30th of April. After shooting through the Chang-chenmo valley, but seeing no good rams, I returned by another route to the same spot where I had last seen my three old friends, and on nearing camp, on May 24, I found their fresh tracks, which I followed until I saw into which nala they led, and then left them for the next day. Making an early start next morning, we picked up the tracks, and for some time made slow progress owing to the stony ground, but on arriving at the top of the nala and peering over I saw one ram within easy range.

My shikari, deceived by seeing the bullet strike the ground on the far side of the beast, declared I had missed it, but from the cramped way it ran down the hill I made sure it must be hit. Running down the hill and looking over some rocks where it had disappeared, I saw it standing with its head down, when, putting two more bullets into it, I finished it—a good ram, with thick horns. I sent into camp for men to carry the meat and for my camera, and after photographing it we went on to look for the other two rams, but it was not until we were returning to camp that we came across their tracks. We followed these until we spied the rams on a big plain by the Pangkong lake in a place quite impossible for a stalk. After watching them for some time in the hope of their moving, we returned to camp. The next day we found them on a small plain, but it was impossible to approach nearer than 300 yards, and as the small ram had ceased feeding and lain down I attempted to crawl into a small ravine which would bring me about 30 yards nearer, but I was detected by one of them, which got up and made off slowly. Running across the ravine as quickly as I could, I lay down for a shot at the big one, and as he stopped for a look round I hit him well behind the shoulder, dropping him at once.

The foregoing account of stalks, taken from my diary, shows several unsuccessful and two lucky days after the same animals, and goes to prove how they stick to the same ground. The argali is not only extremely quick-sighted but also has wonderful powers of scent, and with an ever-changing wind his pursuit will always be a difficult one. I felt very satisfied with securing seven good heads in two trips, killing most of them in the Hanle direction, where I saw more of them.

H. C. V. HUNTER.

OVIS POLI-SHOOTING

According to my experience, these are the most difficult of all sheep to stalk. They frequent perfectly open slopes and spurs and choose a position which commands all approaches. The atmosphere of the Pamir steppes is very clear and an intense stillness prevails, and as the sportsman must not only move unseen but unheard, he has to be very careful as he moves along over the loose shale and debris of which the

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slopes are generally formed. For this work there is nothing to equal a pair of Scafes' patent soles, with the india-rubber tabs projecting well beyond the soles.

The old rams invariably keep apart from the females, except of course in the rutting-season; they run in small herds of six or eight, and when lying up for the day, one at least is sure to be on the watch. The only time to hunt is early morning or evening when they are grazing. In the early spring they also graze at intervals during the day, and you may then get a chance.

Wind is another point to be considered, for this sheep has also a very good nose, and a back eddy will often spoil a good stalk just at the critical time. Owing to smooth undulating slopes and clean-cut sky-lines, a close shot at a wary old ram is not often got, and the sportsman has usually to content himself with a shot from 200 to 300 yards. For this purpose the small bores now in use, .303 or Manlicher, are very good, for in those high altitudes they shoot very well at long ranges. I consider them at least 100 yards better than the old .450 or .500 express. Absence of noise and smoke is also a consideration; they are also easier to shoot with and more accurate.

The Kirgiz of the Pamirs hunt a good deal, but they are very lazy and never walk if they can ride, consequently they mostly kill females, which run in very large herds and are easier to get at. If the sportsman wounds a ram he must be prepared to follow up himself and take precautions to find his way back to camp alone, as his attendant will probably be left behind if anything like a long chase is in question. In conclusion, I should advise any sportsman visiting the Pamirs, or in fact any other part of Asia, when fitting out an expedition, if possible to hire and never buy his transport animals. I have always been able to do this, and have thus saved a good deal of money and trouble.

C. S. CUMBERLAND.

SEROW-SHOOTING IN BURMA

Serow are found on all precipitous rocky hills in Burma which are covered with dense jungle. The sportsman can either have them driven out, which is the usual way in Tenasserim, or stalk them, as in Arracan, though sometimes one stumbles across them

when out after other game. The animal is the ugliest-looking beast I have ever seen, and has a most peculiarly awkward run ; in fact it looks exactly as if a child's rocking-horse was moving along, that being the only way I can describe it. Beating for serow is carried on in the following way. Three or four guns start out and are posted in the paths made by the goats, to which they always keep. Getting to one's post entails the most terrific exertions, which may be easily understood by one who has seen even from a distance the peculiar pinnacle-shaped hills near the Salween Valley. The beaters then go round and, with shouts and musical instruments, drive the game along. If a serow breaks cover, he usually gives a very easy shot, as he runs some 20 yards, and then invariably stops, then goes on again, then stops again, and so on. I recommend a .303, with Holland's peg-bullet ; but be careful of going near a wounded animal, as they are savage brutes. Sometimes in one of these beats a Malay bear is driven out, as happened in May 1899, when I was out with a friend in the Salween. The best time for these beats is in the hot weather (February, March, April), as the jungle is more open then, and one can see the beast for some distance. Stalking is very uncertain ; the best plan is to go along the tops of the cliffs on which the serow are known to live, and look carefully over and examine all the ledges on the cliffs, and with luck one may see a buck lying down resting, when of course a good "pot-shot" is obtainable. Serow frequent the same ledge for long periods, as I have come across huge heaps of droppings in such spots. The best time for this kind of sport is usually considered to be the hot weather, but when I go out again I shall try the rains, as I have been told that in heavy rain the animals live in small caves in the cliffs. There is a very fine and quite tame buck in the district in which I was lately stationed. Two Burmese were out with some Pariah dogs, when they saw an old female with a kid. The dogs gave chase and pulled down the kid, which the Burmese secured and brought up. I offered ten pounds for the beast, but when the kid was first caught the owner's small child was suffering from some skin-disease ; the kid licked these sores, which soon healed, so the Burman would on no account part with the animal. When I left it stood about 3 feet and was still growing.

Serow-flesh is dark coloured, but tastes very good, having no goaty smell.

C. W. A. BRUCE.

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INDIAN GAZELLE-SHOOTING

As the Indian gazelle, commonly called the chinkara or ravine deer, is not very difficult stalking, I am afraid there is very little to be said about it, and I kept no special record of any stalks. In the ravines along the Chambal river there were any number of them, and in the early mornings and evenings they used to be found feeding in the fields close to the ravines, principally in grain fields. The pleasantest way of shooting them was to ride out in the early morning, having men to carry both rifle and shot-gun on the chance of sandgrouse or duck, to dismount when seeing chinkara, and then stalk them. Where not much hunted they were not very shy, and one could sometimes approach them within shot by pretending to be walking past them; but unless one took the shot standing up, they were off before one could sit down and rest the rifle on the knees. I was always rather nervous about rifle-shooting in these flat fields, for fear of hitting a native squatting in the distance, or what would have been quite as bad in a Hindu state—a cow—and I consequently preferred following them in the ravines where there was no danger of hitting any one, and the stalking too was much more interesting. The villagers often keep tame chinkara, and on one occasion I saw, a long way from a village, what I thought was a wounded buck. Through my glass I could see what looked like a streak of blood on the neck, and thinking it would be a merciful thing to finish it, I stalked and killed it, and was very much astonished when I found I had shot a tame one, with a piece of red worsted tied round its neck.

I once saw the Rana of Dhalpur gallop after a chinkara and just touch it with his spear, but not kill it; no one but a very light weight, well mounted, could do this, as they are very fast. I used to consider them very good eating, especially the saddle. They are to be met with over the greater part of the north of India, where the country is rough and broken, and not damp. I have never seen them in thick jungle, but they are very fond of a thin thorny jungle. They make capital rifle practice, and on going out to India one could not do better than commence with a turn at the chinkara before trying scarcer and larger game, for although they offer a very small mark, in most parts where they exist they are sufficiently numerous to ensure one's having several shots in the day.

H. C. V. HUNTER.

GOA-SHOOTING

It was in a nala called Futta-tuk, to the south of the Indus, not far from Tiri, in Ladak, I first met Tibetan gazelles, but owing to a howling wind I made wretched shooting and only secured one head. From there I went on to Hanle, which I reached in the beginning of May, and found them much more plentiful, securing six more good heads, one of them with horns of 13 inches and another 12½ inches; but here too there was a tremendous wind daily, and even if it had been possible to hold a rifle steady, the coldness of the wind made one's eyes fill with water directly one tried to take a sight, and I consequently missed several shots which under ordinary conditions ought to have been certainties.

At Hanle I engaged an old shikari, who produced excellent letters from Colonel Kinloch, the author of that well-known book *Large Game Shooting in Tibet*, dated 1870. On the 8th of May I started across the plain, covered with kiang, for the hills opposite Hanle, crossed the Hanle stream and ascended a hill, on the slopes of which we saw a herd of thirteen Tibetan gazelles, all does, and on the plain on the top yet another herd with some good bucks in it. I crawled in towards them, but at last some does, who could not quite make me out, began to give the alarm, coming slowly towards me all the time. Waiting until some bucks came into sight out of a hollow farther off, I fired and believe missed my first shot, but as they ran confusedly about, they gave me the chance of firing one or two more shots. I knocked over a good buck and hit another, which separated from the herd and went away over the plain, another one joining it; the ground being too flat to approach them I had to leave these and started after another herd I had seen in the distance, containing one good buck. After a long stalk I killed it, but not until I had fired several shots at it.

Like the Tibetan antelope, goa often run about quite confused after the first shot and give one an opportunity to put in several more. In winter and spring they carry very long coats of a yellowish-white colour, and are very pretty and graceful little beasts, but a small mark. I do not think they are anything like as quick at winding one as the sheep. I think a Mauser or .303 would have a great advantage over the express for all Ladak game.

H. C. V. HUNTER.

NILGAI-SHOOTING

I cannot recall anything of interest in shooting nilgai, for as their horns are a very poor trophy, I think most sportsmen would, like myself, be satisfied with shooting two or three examples, just to obtain a good specimen. They afford very little sport to shoot and are a big mark, but are very tenacious of life and will sometimes carry away a good deal of lead. The few I have killed were secured in Dholpur and Rewa, and I found them principally on rough stony ground in thin thorny jungle, and had little difficulty in stalking them. In some Hindu states the natives do not approve of their being killed, looking upon them as related to the cow. I have never seen one ridden down and speared, and the nature of the ground where we found them did not admit of our trying it, but there are many accounts of blue bulls being successfully ridden down.

H. C. V. HUNTER.

SWAMP-DEER AND GAUR-SHOOTING IN CENTRAL INDIA

Gonr are to be met with in the open glades of the forest during the early morning and evening, but in the daytime take shelter in the thickest covert available. As the name "swamp-deer" implies, they are frequently dwellers in swampy districts; but this is the case only in the sub-Himalayan forests, and does not apply to the deer of this species found in Central India. When shooting in the Mandla district, we found these deer in a great flat forest region, broken by beautiful grassy glades, some of which were a mile or more square, and frequently with a clear stream running through the middle. On my arrival I had heard one or two gonr calling or braying during the night, and so was anxious of getting a shot. As we proceeded to our ground the grass seemed alive with beasts; sometimes a sounder of pig would start off, then a kakur after a few preliminary barks would race away as if the devil was after him, and now and again the little four-horned antelope would rush through the grass. Soon we left the glade and got into the sal forest, which is fairly open on the flats, and as I walked a sambar went by with a rush, but I had time to see his head, and as he was not a representative specimen I let him alone. At length we

reached a spot where the grass was pretty high in the open, but not too high to hide the heads of the herd of swamp-deer that were taking their breakfast therein. We stood where we were in the shelter of the trees and counted them—three stags, all worth shooting, and fifteen hinds. There was no hurry, as it seemed better to let them feed nearer the forest side before we tried for a shot, as we could not tell which side they would make for as yet, since they were grazing about in an aimless way. As we watched them, there arose from the middle of the glade another stag, with such a pair of antlers that almost made my hair stand on end. There he stood with his grand head well above the grass, swaying to and fro as he moved leisurely about amongst the herd. In a short time the shikari said, "I think we had better get round to the opposite side of the glade and meet them as they enter the forest, as the sun is getting warm and they won't be long in the open." As there was no wind to bother us this was an easy matter, and I took up a position in front of the advancing herd behind a patch of high grass. To my great joy the big stag was well in the van. I was afraid that one of the smaller ones or hinds might form an advance guard and discover me before I got my chance; but they advanced very leisurely, first one leading, then another, browsing as they went. As they got nearer the hinds came more to the front, much to my disgust; and soon the leading one was within 50 yards of me, while the only one I wanted to shoot at was falling back; nearer and nearer the hinds came, till they got within 30 yards, and then 20. Now I had heard that gonr when surprised suddenly will stand quite long enough to afford a steady shot, so, rising to my legs, I saw that my stag was only about 60 yards off, his body covered by the long grass, but his head and neck perfectly clear, standing looking straight at me. I threw up my rifle and drew a bead just where the base of his neck should be, and pulled off. When the smoke cleared my stag was nowhere to be seen, but the rest of the herd, scattered by my sudden appearance and shot, had made off as hard as they could go. I took a snap at another stag as they went by, but missed. Feeling sure that my beautiful stag must be dead, or I should have seen him go, I walked straight through the grass to where I saw him last, and there he lay in his last gasp with a bullet through his throat! He turned out to be the "record" at that time, but I believe one with antlers half an inch or so longer in the beam has been shot since.

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After shooting a few more deer I moved on to a part of the district frequented by gaur. In years gone by not only gaur but buffalo were to be found in the Mandla district, but rinderpest carried off a number of the former, and the latter disappeared altogether, probably having migrated in the direction of Sambalpur where they are now to be found. Gaur are more difficult to hunt than deer, as they rarely come into the open, but keep to the forest and the flat-topped hillocks called *dādurs*, on which the jungle, though not high, is very thick and difficult to see through.

My first day was rather a failure. I took out my heavy 12-bore rifle, and with the shikari started off to strike the trail of a herd. After about two hours' work we struck one which led us up the steep side of one of the flat-topped hills. Here we found the jungle rather thick on the slopes, the ground being dry and stony, but when we reached the top it was fairly open, clumps of bushes occurring here and there. We still followed the trail, which was well defined, and indicated a herd with some fairly big animals among them. Owing to clumps of bushes and high grass one could not see very far ahead, but this made it all the better for the final approach, and my shikari said it was rare to find a herd on such good ground for stalking. As already said, the tracking was easy, and the herd were evidently grazing as they went, so I had great hopes of getting a shot. This indeed came rather quicker than I expected, for all of a sudden, straight in front and looking directly at me was the head of a gaur bull. I could only see his head and neck, but as he was only a gun-shot off I thought that good enough, and aiming at his head, fired. The next moment I saw his heels in the air as he rolled in the grass, and then there was a tremendous stampede all round, cows and bulls appearing to be all over the place; but owing to the jungle-patches I could get nothing of a shot—in fact I could not even tell the bulls from the cows. However, when the turmoil was over, I walked cautiously to where I expected to find my beast; there were indeed the marks of his struggle on the ground, and patches of blood, but no bull, and I then remembered with dismay the advice that an old hunter once gave me: "Never shoot at the forehead of a bull looking at you, for it lies at an angle of 45°, and unless you catch him on the nose, your bullet will only glance off the skull. If you shoot at the nose or below, you will probably catch him on the throat, which will doubtless stop him." For two hours I followed a blood-trail, but had to give it up at last, as the bull had

gone right away. Three days after a Baiga came to my camp, and in course of conversation told me that he had been chased up a tree by a gaur, with a very wicked expression of face. My bull! "I will give you five rupees if you will show me where he is." "No, Sahib, nor yet for ten or twenty,—I value my life more than that." I could only get a sort of general idea as to where he was, and I had a notion that my shikari was not inclined to help me much. At all events, I did not find the bull. The next one I went after was a solitary bull, which I came across in the thick forest. I could just see his flank, and planted a bullet behind the last rib, which is a very deadly shot.

C. S. CUMBERLAND.

HOG-DEER STALKING

Most of my hog-deer shooting has been done in the Nepal Terai, on the western boundary, where they abound, and good heads are plentiful; but as the object of our several trips was principally tigers, we did not pay any attention to hog-deer, except when general shooting was allowed on our way home to camp; then, as the line of elephants proceeds through patches of long grass, and the hog-deer break across the open burnt plain to another patch, they make very pretty practice with a rifle, but it was a little time before I got the knack of hitting them from a howdah, which is generally very unsteady, and one must take snap-shots. Now and then a hog-deer would break through the line of elephants, who, mistaking it for a pig, would trumpet shrilly and almost stampede, for there is nothing they are more frightened of than a boar, who often inflicts a gash in the leg in passing. When out by myself, camped on the banks of the Sardha river, I often used to take a couple of pad-elephants, and starting before daylight work quietly along the edge of a swamp, to catch the swamp-deer before they returned from feeding to lie up in the swamp during the day, and on one of these expeditions I shot a particularly fine hog-deer with antlers $19\frac{1}{4}$ inches long and a spread of $18\frac{3}{4}$ inches. On another occasion, when prowling about on a pad-elephant after spotted deer, I killed a hog-deer which appeared equally big, but the antlers were unfortunately in velvet. Hog-deer appear to have no regular time for shedding their antlers. When out on an elephant one hardly ever gets a standing shot at them. They abound on all the grassy islands and banks of the Sardha river,

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but unless some of the grass has been burnt it is almost impossible to see them as they rush through it. Now and then a shot well below where one sees the grass waving is successful. By the middle of March a great deal of the grass has been burnt, and then one can have good sport with them by forcing them into the open, the spot where every bullet strikes on the dusty burnt ground being seen. In the Terai it is difficult to get about without an elephant, and I do not think many hog-deer could be obtained shooting on foot. On one expedition a young one was caught, and became very tame indeed.

I think that a 16 or 20-bore paradox would be the best weapon for this and all howdah shooting.

H. C. V. HUNTER.

THAMIN-SHOOTING IN BURMA

Thamin are found throughout Burma in suitable localities from Manipur down to the sea. In Upper and Lower Burma they seem, however, to inhabit different kinds of jungle. I went down to the famous Pegu plains once to shoot them, and was astonished to find the animals inhabiting huge plains of "kiang" grass (*Saccharum* sp.) interspersed with "kwins" (open areas covered with short grass), whereas in Upper Burma I had hunted them on peculiar hummocky-shaped hills covered with eng trees (*Dipterocarpus tuberculatus*), the engdaing forest of the Burmans, with level open spaces ("kwins") between the hills, while in other districts of Upper Burma I had even found them on low hills with no trees bigger than the zibin (*Zizyphus jujuba*). I have noticed that engdaing that holds hsaing does not hold thamin, and *vice versa*. Mr. Blanford in his *Indian Mammalia* has been misinformed (p. 542) in saying that they always inhabit flat alluvial ground, since I have shot them in the Yamethin district close to the Pegu Yoma, and both in Magwe and Nimbu in engdaing which by no stretch of imagination could be called flat or alluvial.

Lower Burma heads, *i.e.* those from the flat alluvial plains, certainly average bigger than ordinary Upper Burma examples.

The best time to shoot thamin in both Upper and Lower Burma is in the hot weather, March and April (early in July the antlers are said to drop in Lower Burma—at least that was what the Burmans told me; I cannot speak from experience, as I

was only shooting there in March). The tall grass is then burnt off and one can see them better, and also they come out on the kwins earlier in the afternoon and stop out later in the morning eating the tender new grass. The usual method in the Pegu district is to hire a cart and drive before dawn on to the plains with two men, one to drive the bullocks and the other to stand up and keep a sharp look-out; directly the latter sights thamin the cart is driven towards them; small stags and females will allow the cart to come within shot, and some so-called sportsmen knock the beasts over from the cart, but the solitary ones and finer stags in the herds are too wily, so the cart is left, and then some very pretty stalking can be done, crawling on one's hands and knees to within easy range. I found the hunters in Pegu always wanted to get too close, though they showed a marvellous knowledge of the direction in which the herd would run away.

In Upper Burma, where the country admits of a cart being driven, this method is also used; but fortunately the hummocky engdaing will not admit of even a Burmese cart being driven over it, and then the way to get thamin is by walking to likely grazing-grounds, or where they were seen last by stray villagers, till one comes across them, and then stalking them. The early morning, up to say 9.30, and from 4 o'clock till dusk are the two best times to look for them, as they are then out grazing. Their sense of smell is very keen; they will, however, often stare for a long time at an intruder, thus giving plenty of time for a steady shot. The best weapon I have found has been a .303 with a Holland and Holland's peg-bullet; I have only once lost an animal struck with this. The absence of smoke also confuses the animal, as in case of a miss he stares about not knowing where to run. Once at the end of a long day I missed a stag three times; at each shot he simply looked round, only to fall dead to the fourth.

The flesh is coarse and poor eating; many Burmans will not touch it, as they say it renders the eater liable to leprosy.

Thamin are often killed by Burmans with a dah (large knife). Two men go out at night, one with a light on his head (in a cooking-pot, the light shining through a hole broken in the side); the thamin, when he sees this light, stands staring at it, while the man's companion, the one armed with the dah, sneaks round and hamstring the deer. Many also are caught in huge nets into which they are driven, and many in the

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rains are speared from boats while swimming from islands left in the inundated plains.

In some parts of Upper Burma (Meiktela, for instance) thamin are sometimes driven past the guns. It is poor sport, which I have never seen.

There is no difficulty about getting thamin if one goes at the right time of the year, and of course no danger, except from sunstroke. C. W. A. BRUCE.

The best time of year for thamin-shooting in Burma is during March, April, and May, the stags not being out of velvet before the end of February. This means hot weather, but the nights are cool, and there is but little risk of fever at this season. Being a plain-loving species of deer they are found in considerable numbers on the great plains of Lower Burma, which lie between the hills and the sea; here they may be met with in herds ranging from six or eight to forty and over.

Owing to the large numbers killed by natives, the day is not far distant when they must become very scarce. In the rains, when the grounds are swampy, Burmese mounted on buffaloes surround entire herds, and closing in destroy the majority. Later, when the rains are more advanced and the plains flooded, the deer are forced to congregate on high points of land, where they become an easy prey, being attacked by men in canoes and soon killed off by dogs, spears, and "dahs." The flesh is prized by the natives, some being cut into strips and "jerked" for future consumption. Districts formerly well stocked with these beautiful animals are now almost deserted.

Thamin graze on and off between 3.30 P.M. and 9.30 A.M., when they lie up in the long grass for shade and rest. They are most frequently found feeding in open patches, caused by the elephant-grass (kiang) being burnt off, on which a shorter grass grows. These, and other patches, which were swampy during the rains, but retain enough moisture in the dry weather for the growth of short succulent grasses, are known as "kwins," and are their favourite feeding-places. When disturbed thamin do not make for covert, but go off with big bounds, settling down into a steady swinging trot, and stopping now and then to look at the cause of their disturbance. When wounded they invariably make for covert, and once in the tall elephant-grass, which is extremely thick, and attains a height of 6 feet or more, their detection is almost

impossible. Sometimes a stag may be recovered by dogs, from one of the native fisheries frequently met with in these grounds, the dogs in the Pegu district being a famous hunting breed.

At other times, the ever present vulture may scent out the animal; but so far as my experience goes a wounded stag once in the "kiang" is as good as lost. It follows, then, that the weapon used must be capable of giving a knock-down blow, as the animal is often met feeding close to dense covert.

Starting from camp or bungalow, for grounds where we expect to find thamin, two methods present themselves. To take a high bullock cart, which will enable one standing up to see over the grass, and with a good pair of binoculars detect the quarry, feeding in kwin or open patch, when we can dismount and stalk. A good plan is to make for an old pagoda or tree, from which a view of the surrounding country can be obtained.

Another method is to go on an elephant, which being higher than the bullock-cart affords a better view. Thamin are not much alarmed by the sight and smell of elephants, as during the rains herds of wild ones visit these plains. In some parts of Upper Burma they are shot from bullock-carts, which are so covered with green boughs as to be almost invisible.

Providing the ordinary precautions regarding direction of wind, cover, etc., are taken, thamin are not very difficult of approach; but if the grounds have been disturbed, especially by dogs, they are exceedingly shy, and alarmed at the least thing. During the rutting-season (April and May), when the stags are with the herds, I think they are harder to get near, and many a long hot crawl has been quite spoiled for me by the inquisitiveness of one of the hinds, before I could get within range of her lord: at this period the hinds are very sharp and on the *qui vive*.

I think the best weapon for thamin is a magnum .500 or .500 express. A full-grown animal is difficult to kill, and unless "dropped in his tracks" very often escapes into covert. That splendid weapon the .303 has hardly sufficient striking power, and does not give the requisite knock-down blow; the only stags I lost were shot with this rifle. One stag I hit with a Jefferies' bullet at 150 yards ran nearly 200 yards before he dropped; on examination I found the bullet had passed through his lungs, ploughing up the lung-tissue, which was quite "blooded" and showing a

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terrible exit wound, with a portion of two ribs carried away; yet with this injury he had almost reached covert. A similar shot with a magnum '500 would have dropped him on the spot.

G. R. RADMORE.

LION-SHOOTING IN KATHIAWAR

Formerly the Indian lion is said to have been common enough in parts of Central India, Guzerat, and over the whole of Kathiawar, but it has long since disappeared from the two former districts, and at the present day is only found in the latter province in the Gir forest, a wild tract of country, some 1500 square miles in area, situated in the limits of the native state of Junagarh, where also, owing to the gradual advance of cultivation, it is yearly becoming scarcer in spite of a half-hearted attempt to preserve it.

Lions are, as a rule, met with in parties of two or more, consisting sometimes of a family, sometimes of lions only, and at others of a lion and one or a couple of lionesses.

They commit considerable havoc amongst the cattle, which are brought into the Gir for grazing purposes during the greater part of the year, besides helping themselves liberally to the sambar, nilgai, spotted deer, and pig with which the forest abounds. Owing to this plentiful supply of food, they rarely if ever return to a "kill." I have never known or even heard of an instance of their having done so. They are great wanderers, and as a rule do not lie up in the neighbourhood of a "kill," but go clean away after taking their fill. They are very partial to spending the day under the shade of a large tree, generally a *banyan*, where they can get the full benefit of the cool sea-breeze which even in the hottest weather reaches the Gir during the course of the afternoon.

Owing to this habit of wandering, added to the fact of the ground being generally very hard and rocky in most parts of the Gir, the services of good trackers or *pagis*, as they are locally called, are indispensable for the successful pursuit of the lion. No better men at their work could be found than the Gir *pagis*, the best of whom are *Seedees* whose forefathers found their way into the province in former times from the coast of Africa.

When a recent "kill" has been found the work of the *pagis* is comparatively simple. It is when no "kill" is forthcoming, and time is an object, that they have to put forth their best energies. Their only plan then is to take advantage of a habit the lions have of roaring when wandering about the jungles at night-time in search of their prey. The men take up their positions in small parties of two and three in likely parts of the jungles early in the evening, and as soon as a particular party hears a roar, it at once commences to follow up the animals, guided by their roars only, and keeps up this kind of work until the morning, when the tracks are picked up and followed over hill and dale until the animals are marked down at the spot they have selected for spending the day. *Khubber* is then sent to the sportsman who may be a dozen or more miles away. When the latter has arrived, it rests with him either to attempt a "drive" or to take his chance by walking up the animals. Driving is usually resorted to and is undoubtedly the safest plan, but it is obviously more exciting to walk them up; and in a very open jungle where it is difficult to drive the animals in any particular direction, this is undoubtedly the best plan for making as sure as possible of a bag. I have been successful in both ways.

A wounded lion is just as ready to charge as a wounded tiger. I certainly prefer a larger bored weapon, either gun or rifle, for this kind of game; the smaller bores are in my opinion almost perfect for use against deer and such-like animals, but quite out of place against all kinds of dangerous game. My lions I bagged either with a .500 express or a No. 8 smooth-bore. With the express I advocate the use of a solid or only a partially hollowed bullet, not the ordinary express bullet with a large hollow, which has played me false on more than one occasion.

In some parts of the Gir, large deep holes, or *bohirs* as they are locally called, are met with. They have evidently been formed by the action of water, and many of them, I am told, contain either mud or water at the bottom. Anyhow, owing I imagine to their being cool, lions are much addicted to lying up in them. When watching the mouth of one of these *bohirs* one evening, one of my shikaris saw two lions, a hyæna, and two porcupines emerge from it at short intervals! The lionesses are also given to dropping their litters in these holes. The cubs are born at the beginning of the monsoon or rainy season.

A large number of lions are kept in captivity in the State gardens at Junagarh,

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where they breed very freely. A good lion measures from 9 to $9\frac{1}{2}$ feet in length. Like tigers, a disabled lion is apt to take to man-eating. From its colour the lion is sometimes locally called the *Untia bâgh* or camel tiger, but the name by which it is generally known in the Gir is *Savag*, a word said to be of Arabic origin, meaning "he who causes the flocks to bleat." The lioness is called *Shian*. It is a curious fact that although panthers are common enough in the Gir, neither tigers nor bears are found there.

L. L. FENTON.



FIG. 62.—Indian Lion in captivity at Junagarh. From a photograph supplied by Col. Fenton.

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